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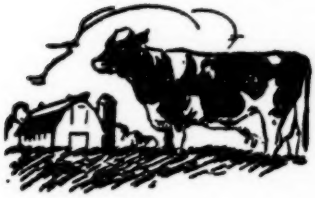
The **Farmer's Digest**

Volume 22 February 1959 Number 8

Our Cows Must Have Twins



More twins are a necessity if we're going to get more beef without endangering the dairy herd replacement position tells this English article . . .

Condensed from Dairy Farmer

Dr. John Hammond

THE increase in the proportion of inseminations from beef bulls in our English dairy herds has been very marked in recent years. It cannot go much further without endangering the supply of heifer replacements unless the culling of cows is reduced.

How then can we continue this practice without endangering the supply of heifer replacements for the dairy herds?

The answer is to induce the cows in dairy herds where calves are required for beef to produce twins, and possibly sometimes triplets, as our most profitable breeds of sheep do.

Experiments to produce twinning in cattle were first started at Cambridge (England) in 1939.

The number of eggs which are shed by the cow at a heat period is determined by the level of a special substance in the blood (FSH or follicle stimulating hormone) which comes from a gland lying at the base of the brain. A cheap substitute for this (PMS) can be obtained from the blood serum of mares between the 45th to 90th days of pregnancy.

If PMS is injected into the cow some four days before she is due to come on heat, instead of ripening one egg as normally occurs, she ripens an increased number according to the dose used. With a high dose, up to 50 eggs have been ripened at one heat period.

Reprinted by permission from Dairy Farmer, Lloyds Chambers, Ipswich, England

These eggs can be fertilized but where large numbers are produced the cow cannot carry them all and they degenerate or are aborted.

Experiments were made later to find out what was the best dose to use.

For large-sized cows, a dose of about 2,000 international units of PMS was found to give twins on average, but some produced singles and a few triplets. Some of the triplets produced were rather weak at birth, but it was found that, like ewes, if the cow was well fed for some six weeks before calving, strong triplet calves were produced.

As with sheep, twins and triplets are smaller than single calves at birth, but if well fed they grow and develop well after wards, as those who rear natural twins know well.

This twinning induced by hormone injection is suitable for dairy cows inseminated from color-making beef bulls where the calves are to be reared for beef. It should not be used on dairy cows to breed replacements for the herd.

All the extra calves produced by the treatment are either bull calves or freemartins, and the number of heifer calves remains the same.

This is because where a heifer calf is co-twin to a bull and the blood vessels fuse, the hormones from the bull switch the heifer over to the male side. Freemartins, however, although they will not breed, are quite good for beef purposes.

Injection for the production of twins in the dairy herd is a comparatively simple procedure, for the injection under the skin is made 17 days after the last heat period.

In beef herds, however, it requires the employment of an expert. Beef cows suckling calves do not show the signs of heat like a dairy cow and so it is not known when 17 days after the last heat will be.

Exhaust fumes are deadly. They give no warning of their danger since they are tasteless, odorless and colorless. So when you run your car, truck or tractor engine, open those doors! Let that life-saving fresh air in and the man-killing fumes out.

Experiments have shown that the best way to deal with this problem is for an expert to squeeze the corpus luteum from the ovary per rectum when a large corpus luteum is present and then immediately inject the dose of PMS.

In the last few years much experience has been gained in injecting PMS to increase the fertility of ewe flocks in different

breeds and under various conditions of farming. It is more troublesome in sheep than in cattle for a teaser ram has to be used to mark the heat period before injection, but in many cases it has been found worthwhile.

So far, this induced twinning by hormone injection for beef has only been done experimentally on a few selected farms. But the time seems to have arrived when it should be tried out on a commercial scale, at first preferably on cows. With heifers the nutritional requirements before calving should be studied further before it is put into practice.

At the present price of beef and veal calves in the markets of our country, it should be a profitable proposition to the dairy farmer.

Salt's Use As A Protein Regulator Spreads

The western range practice of using salt to regulate protein supplement consumption by cattle and sheep is spreading to the south and southeast. Florida, Alabama and Louisiana have reported success with the salted meal feeding system. Authorities say mixing with salt is one method of giving all animals in a pasture equal opportunity to get the quantity of supplement required to balance the daily ration.

The use of self-fed salted meal saves labor as compared to hand feeding, facilitates less disturbance of grazing animals, more uniform consumption of protein and better distribution of grazing.

Researchers suggest a thoroughly mixed supplement of 75 per cent cottonseed meal, 15 per cent salt and 10 per cent complete mineral to limit meal intake to one pound daily per animal and advise frequent observation during the first two weeks of feeding because the formula may have to be changed to meet feed conditions in the pasture.

It is advisable to separate cows, heifers, steers and calves in different pastures and to start feeding at a low level, letting the cattle become accustomed to the mixture gradually. Water should not be too far from the feed bunks. —*Salt Institute*

Swine Fit Any Farm

Existing buildings can be remodeled or new ones erected . . .

Condensed from Pennsylvania Farmer

B. Wayne Kelly,

Extension Farm Management Specialist

ARE you thinking of swine for extra income on your farm? We suggest that you consider the facilities available for swine in your operation. Then decide what is needed in regard to number of farrowings per year, investment and labor required.

There seems to be little doubt from studies made at Purdue University on 54 actual records that a sow herd of 40 to 50 sows gave the greatest net return per sow. However, in all cases in this study, as the size of herd increased so did the net return to labor and management.

No. of Sows	Pigs Raised Per Litter	Weight	Net Returns
40	6.3	222 lbs.	$5,494
60	6.6	229 lbs.	6,824
120	6.9	218 lbs.	11,864

For comparable returns in dairy, it was found according to a 1957 report on 24 dairy farms in Tomkins County, New York, it took 33 cows producing an average of 9,861 pounds of milk to net $5,414. This net represented a capital investment of nearly $53,000.

What investment can one expect in a brood sow operation? This will depend largely on the amount and kind of buildings already on the farm. If there are no buildings at all, here are some guides. Again as the size increases, the cost per sow in building and equipment decreases until the size of the herd increases to about 40 sows. The investment depends on which is the more desirable type of structure, permanent or portable, or whether an existing building, such as a barn, can be remodeled. However, in general, one can expect

Reprinted by permission from Pennsylvania Farmer, Harrisburg, Pennsylvania

an investment of from $200 to $225 per sow for building and equipment.

Satisfactory permanent-type farrowing buildings and equipment, large enough to farrow 20 sows at a time, can be built with material ranging in cost from $3,750 to $4,350, excluding labor. Material for a nursing shed would range from $2,000 to $2,500, less labor, if satisfactory buildings on the farm were not available.

Forty to Fifty Sows

There is some indication in the studies at Purdue University that herds in multiples of 40 to 50 sows may be most advantageous in respect to building cost and equipment.

In general a farmer plans for year-round labor for the family. As the family grows and declines the swine farmer can adjust easily his business to take advantage of the efficiencies in equipment and improved management that have resulted.

Usual standards on labor are five sows to one cow. In a study made at Ohio State University by Bailey and Sitterley, it was noted labor required per sow was reduced until the herd reached 20 to 25 sows. Little change was noted by Bauman and Powlen at Purdue University until the herd reached 40 to 50 sows, where nine hours per sow per year was reported on a two-litter system until weaning time. The average of 54 herds farrowing 31.7 sows twice a year required 14 hours to weaning and 13 hours additional from weaning to market per sow and litter, or a total of 27 hours of labor. With a reported net return per man-hour for the average of $4.38, the high return for man-hour was $7.01 for the 50-sow herd group.

To use buildings and equipment more fully, multiple farrowings a month (two or more groups of sows farrowing a month or so apart) seem advisable in view of higher building costs. A system used by some farmers has been to farrow one half the herd in January, the other half in April; similarly the fall farrowing in July and October.

Also, economies are found in spreading the labor load over a longer period. This practice will also allow the present hog producer to double his herd of sows at little cost.

On many farms the hog enterprise will not require all the land, and in most cases excess pasture and roughage will produce additional livestock, such as sheep, beef, or dairy which have been found compatible in relation to labor and feed.

A normal lambing and calving time falls when less time is required with the swine enterprise. Also sheep and cattle are large

consumers of hay and silage while grain consumption except for dairy is relatively small. The return from such an enterprise as 100 ewes or 25 beef animals could add another $2,000 to $2,500 for family living.

Summary

As the swine herd increases:

1. Economics in investment can best be realized when the herd is increased in multiples of 20-25 sows to 40-50 to 80-100.

2. Under improved farm practices for swine, farmers can receive farm wages comparable with those from other farm enterprises.

3. Investment depends on kinds, amount, and adaptability of buildings already on the farm. If new buildings are necessary, an investment in materials ranging from $5,750 to $6,850 may be necessary.

4. Labor requirements will range from 9 to 14 hours per sow to weaning age of pigs, and an additional 9 to 13 hours will be required per sow per litter to market time, or a total of 18 to 27 hours depending on the efficiency of the building, feeding, and water equipment. (40 sows x 27 hours = 1,080 hours).

5. Multiple farrowings will increase use of specialized buildings and equipment, reduce costs per sow, allow for expansion of herd, and spread labor load more evenly over the year.

6. Farmers may find a minor but compatible enterprise of sheep, beef cow herd, or dairy desirable to use excess pasture and roughage, thus increasing the net farm income as much as $2,000 to $2,500.

New Test for Protein in Milk

A new method for determining protein content of milk has been developed at the University of Wisconsin. The test is simple, inexpensive, and fast. If further experiments show the test is consistently accurate, it could probably be used routinely in dairy plants, according to biochemist R. M. Bock who developed the test.

Because of the demand for milk protein by the cheesemaker and also the trend of consumer preference for high protein foods, protein tests might be used in the future to help determine the price paid for fluid milk. The new test might also provide a basis for herd improvement from the standpoint of protein production, Bock says. Each individual cow could be checked for protein yield.

Any cow not "paying her way" in milk proteins could be culled from the herd in much the same manner as cows are presently culled for low butterfat production. *Wisconsin College of Agriculture*

Grow Corn In 21-Inch Rows

530 acres of corn in 21-inch rows cribbed 125 bushels an acre. This Illinois farmer says, "I'm going to do it again . . .

Condensed from Farm Journal

Harold D. Guither, University of Illinois

FOR James F. Holderman, 1958 will go down in history as the year he risked 530 acres of corn in 21-inch rows—and won!

For corn growers everywhere, 1958 could well be a milestone—the year when we finally started to break away from planting corn in rows the width of the ox yoke.

Holderman, who farms in Grundy County, Ill., has just finished cribbing 125 bushels per acre from 530 acres—one of the highest average yields ever produced anywhere on such a large acreage.

But this cribbed yield is only part of the story. In some places, the single-cross hybrid that Holderman planted stood up very well. In others, it lodged so badly that *the picker left up to 50 bushels an acre* in the field. Holderman is salvaging that with his hogs.

Before harvest, Earl Leng, University of Illinois corn breeder, made hand-harvested yield checks on the 200-acre "home farm." One showed 212 bushels an acre; another, 202 bushels. Where the corn lodged, the yield dropped to 143 bushels of No. 2 shelled corn. So Leng estimates that the 200-acre "home farm" actually produced about 175 bushels of corn per acre. On the remaining 300 acres of sandy land, hit by both floods and hail in June and July, Leng's yield checks averaged out 137 bushels an acre.

What spurred Holderman to try planting corn in 21-inch rows?

"Two University of Illinois experiments," he replies. One showed that corn needed only 40% as much water to produce a bushel when the surface of the soil was covered with plastic to prevent evaporation.

The other experiment showed that corn yielded 220 bushels an acre when the scientists planted it two kernels to the hill and staggered the hills two feet apart

Reprinted by permission from Farm Journal, Philadelphia 5, Pennsylvania

in 24-inch rows.

Holderman reasoned that planting in 21-inch rows would shade the ground and thus keep soil temperature low, reduce evaporation, control the weeds and still make maximum use of sunlight. Furthermore, the close spacing and interspersion of roots would give more efficient use of plant foods.

What hybrid to use? Holderman recalled that most hybrids tend to go barren when you crowd 28,000 stalks on an acre. But Bob Copper, corn breeder with Producer's Seed Co., had told him about HY2 x 07, a single-cross hybrid that thrived better than any other in thick-planting tests at the University of Illinois. In 1957, he tried it in 40-inch rows, 18,000 stalks per acre, and grew 95-bushel corn.

How to fertilize? Farm Adviser M. E. Tascher helped Holderman work that out. He plowed down 84 pounds of nitrogen, 55 pounds of phosphate and 55 pounds of potash an acre with the old corn stalks. At planting time, he put 325 pounds of 5-20-20 below and alongside the seed. When he gave the corn its only cultivation (he had sprayed with one pound of 2,4-D per acre before the corn came up) he also side-dressed with another 67 pounds of nitrogen.

How to plant? Holderman rigged up his own 10-row, wheel-driven planter. It really worked. *"We planted 105 acres one day and put on 17 tons of fertilizer besides,"* says Holderman. He planted a kernel every 10 to 11 inches and had 24,000 to 28,000 stalks per acre at harvest time.

Picking the corn presented the biggest obstacle. Holderman approached one company to design an experimental picker but they declined. So he took parts of six two-row pickers and built two five-row rigs—one mounted and one pull-type.

What does Holderman think of 21-inch rows?

"I'm going to do it again," he quickly replies. "I feel 21-inch rows will show an even greater advantage in a dry season because if there's enough moisture in the soil when we plant, our close-spacing will keep it there," he explains. "With 21-inch rows, the corn shoots up high enough to shade the soil in three to four weeks."

Holderman believes he gets a fourth more corn with narrow rows; also feels that he can cut those field losses considerably by picking earlier.

U. S. agricultural exports for the year ending in mid-1959 are expected to be about $3.8 billion, a little less than the year before.

What do others think of Holderman's system? Farm Adviser Tascher is enthusiastic. "Jim has taken research and applied it in a new way. This could be a big break-through in corn growing. If we can get the breeding into corn so it will stand better, the machinery can be made. I've seen nothing like this in my 29 years of Extension work."

Says Earl Leng, mentioned earlier: "This is a corn-growing achievement of the first order. Here is a farmer who has broken with tradition and demonstrated a good reason for doing it. If he can overcome the lodging problem and make harvesting less difficult, I believe he has a system which will be hard to beat for his conditions."

But Leng warns any farmer who is thinking about trying Holderman's system that he must be prepared to accept its weaknesses. "It won't work unless you use a hybrid that can take crowding and will produce an ear under these high planting rates. *The single cross that Jim used is notoriously poor in standing ablity.*"

To make the Holderman system really practical, Leng believes that the corn breeders must combine stalk strength and yielding ability in high population hybrids. Dwarf types offer interesting possibilities. "If we can do it, we could crib 150 to 160 bushels from fields like Holderman's."

One thing is certain: Holderman's 1958 crop has plunged corn growing into a new, narrow "space" age.

Do You Need A Cow Sitter?

There's a chance for a qualified dairy farmer to make a living "cowsitting," says a Michigan State college dairy specialist.

He came up with the idea after learning that some dairymen have gone as long as 12 years without missing a milking.

An experienced hand with dairy cows could make a nice income going from farm to farm relieving operators of one-man farms for a day, a weekend or a week. —*Extension Service*

Milk and Calf Parasites — Where stomach and intestinal worms are a problem in raising calves, it may be possible to avoid early worm treatments by continuing milk in the calves' diets, the U.S.D.A. reports. Many recent scientific tests have shown that milk discourages the development of parasites in the digestive tract. Similar conclusions have been drawn from tests on pigs and lambs.

Cattle Breeding Tips

Condensed from New England Homestead

James R. Wadsworth

IN general, sterility problems of dairy cattle result from faulty management practices and disease. Sound management, or "good cow sense," will actually eliminate many reproductive troubles in cows.

Obviously, a dairyman must be able to recognize signs of estrus or heat. This is especially true during the winter when cows are in the barn. It is well known that cows come into heat at any time of day. They should be turned out twice daily and observed closely each time.

Many dairymen breed their cattle back too soon after calving. Remember—a uterus, after calving, needs at least two months rest before returning to normal. If cattle are bred earlier than sixty days, the conception rate is lower. Also, more trouble may occur in the ensuing pregnancy.

Perhaps your breeding trouble can be traced to an infertile bull. Breeding records in bulls are as important as on cows. How many dairymen change bulls when a cow fails to settle to the first service by one bull? This helps spread disease. In fact, vibriosis is often spread by changing bulls.

Four out of ten cows sold for slaughter are pregnant. Regular pregnancy examinations of your herd by a veterinarian help prevent this unnecessary loss to the dairy industry.

When a cow does not settle properly, something is wrong! Don't wait too long before calling your veterinarian. Many cases of sterility become hopeless because veterinary examinations were made too late. At any given time, nearly 10 per cent of all cows are having breeding trouble. If a cow has had three services without conceiving, she should be examined by your veterinarian. Perhaps she fails to show heat regularly. A vaginal discharge may be present. In either case, an early veterinary examination pays big dividends.

The Dairyman holds the solution to about half the sterility problems in his own hands. Breeding cows successfully means teamwork. Is your veterinarian on your team?

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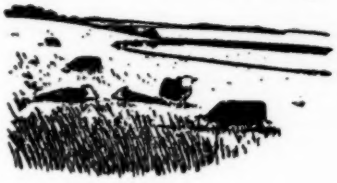
What Does It Cost To Keep A Beef Cow?



Livestock specialists in the leading beef producing areas answer this important question . . .

Condensed from Successful Farming

Mike Bay

OF all systems of beef production, the cow herd is the most inefficient—requiring nearly 3 tons of dry matter to produce 400 to 450 pounds of calf at weaning time.

This is why cattlemen must hold feed cost at rock-bottom level. And, modern research is finding ways to produce beef cattle profitably on land that varies greatly in productive capacity and costs.

Here's how livestock specialists in each of these 5 areas define their least-cost beef cow feeding programs. Their over-all appraisal will give you a chance to get a good look at your competition.

Fertile Midwest

Can a man farming highly productive crop land worth $400 to $500 an acre afford to raise beef cattle? A research program developed by Iowa State College on just such a 300-acre farm holds forth a positive answer to this question. Here an 80-cow herd is being maintained.

The roughage produced is being used to maintain the cows. The grain goes into the calf crop, which is fed out for market. The crop rotation is typical of Iowa — corn-corn-oats-meadow, with Atlas Sorgo or corn silage used for maintaining the cow herd during the winter months. Cows get no grain in addition to that in the silage. During the winter feeding program cows gained about 100 pounds between weaning a calf in the fall and beginning of the spring grazing season, on a ration of this nature:

- 45 to 50 pounds of Atlas or corn silage.
- 4 pounds of ground corncobs on top of silage.
- 1 pound of soybean meal.
- ½ pound of mineral mix.

The cost of such a feeding program is from 17c to 19c per cow per day. Bluegrass pasture during the grazing season is valued at 9c per cow per day. Figuring on the basis of a 180-day wintering period, the yearly cost

Reprinted by permission from Successful Farming, Des Moines 3, Iowa

would be $47.15. This figure may be further reduced by permitting cows to graze stalk fields when available.

The use of larger amounts of cornstalk silage and ground corncobs will effectively reduce the annual feed bill per cow. It should be kept in mind, however, that these are low-quality roughages and must be properly supplemented with protein and mineral.

In making cornstalk silage, large amounts of water must be added at the time of ensiling dry cornstalks. Sufficient packing is difficult but a must. And, it is desirable to add a preservative such as molasses, grain, or chemicals. In harvesting, use either the dual-purpose picker-chopper or a forage chopper.

Best-quality cornstalk silage is made from stalks harvested when the corn grain contains 30% or more moisture. At this stage the cornstalk is still sappy and usually has some green color.

Lower quality cornstalk silage can be made from the stalks by waiting until the corn is dry enough for cribbing. However, most of the leaves are lost and it is difficult to harvest more than one-half to two-thirds of the stalks.—*Solon A. Ewing, Animal Husbandry Department, Iowa State College, Ames, Iowa.*

Less Fertile Midwest

In this area it pays to coast through the winter to get the lowest board bill per cow. Research on the so-called marginal land in southern Illinois has shown that the beef cow herd can skimp along on alta fescue pasture from weaning time in the fall until calving time in early February, saving 2 months of expensive winter feeding.

There is no reduction in weaning-time weight or percentage of calf crop if the cows are put on a full feed of silage and hay for the remaining 74 days before spring pasture.

Such a boarding bill fits this land which after proper renovation is well adapted to a rotation of corn, small grain, and 4 years of pasture. After the second or third time in the rotation cycle, the corn yields have increased from 20 to 75 bushels per acre at the Dixon Springs Experiment Station in Illinois.

Cowboys in today's TV westerns don't have trouble rolling a cigarette. No, sir! It's adding the filter tip that gets 'em!

This is a typical boarding bill of a cow in a 100-cow herd getting maximum performance from marginal land:

- 74-day wintering cost (Feb. 1-Apr. 15)
- 50 lbs. silage/day @ $10/T $18.50

- 10 lbs. hay/day @ $20/T .....$ 7.40
- Pasture costs from Apr. 15-Feb. 1 on 2 to 2½ acres — renovation, land charges, fencing, clipping once, etc. $24.00

Total bill $49.90

Without the use of winter pasture, this boarding bill per cow would be increased by at least another 60 days or about $20. —*R. J. Webb, Superintendent, University of Illinois, Dixon Springs Experiment Station, Robb, Illinois.*

Taxes represent more than one-fifth of the value of all goods and services produced in the United States.

Great Plains Area

The principal cost item in winter cow herd management here is the amount and cost of supplemental feed to balance out the nutrient deficiencies of dry weathered range grass. Cost of supplemental feed may run as high as 80-90% of the total spent in maintaining a cow herd. Where dry grass is ample and pastures are not overgrazed during summer, beef cows calving in February-March can get by on as little as 1 pound of 41% cottonseed meal per head daily from late October to mid-April.

The cost per hundredweight of calves weaned under this low-level supplemental feeding program was $7.46. A 10-year study involving 400 cows showed this level more satisfactory than 2½ pounds C.S.M. or a still higher level of 2½ pounds C.S.M. and 3 pounds oats. The total yearly feed cost per cow was $33.96 for the low-level supplemental feeding program.

There has been a swing to fall or winter calving in preference to spring calving. Cowmen are finding the need for supplemental feed sharply increasing. Cows need more energy, protein, minerals, and vitamin A.

Pastures in the Southwest are not as good as they used to be. Cattle numbers have climbed higher than ranchers realize and the swing to cow-calf herds has placed more stress on native grass.—*L. S. Pope, Animal Husbandry Department, Oklahoma State University, Stillwater, Okla.*

Western Inter-Mountain Area

Here are 3 economical, but nutritionally adequate, rations for wintering pregnant cows weighing about 1,100 pounds:

- Alfalfa or alfalfa-grass hay, good quality—15 to 25 lbs./day. Cost—12c to 25c.
- Native western mountain hay of good quality—15 to 25 lbs./day. Cost—9c to 15c. Plus protein supplement—0.5 to 1 lb. Cost—2c to 4c.

● Range cubes (self-fed) composed of:

Salt 30-35%
Dehydrated alfalfa 50-55%
Molasses 5-10%
Cottonseed meal ..... - 10%

Fed at the rate of 1 to 2 pounds per day, cost is 4c to 9c. This does not include the value of winter range which amounts to about 2c to 5c per head daily.

The wintering period during which one of the above rations might be fed will usually be for about 1 to 3 months.

The early spring grazing season will cover up to about 2 months. Such pasture, at current prices, could be valued 50c to $1.50 per cow per month. On the forest ranges, which are utilized for about 4 or 5 months out of the year, the grazing fee will average about 40c per head per month.

Fall and early winter grazing, for a period of from 2 to 4 months, is a time when cows can draw on some of their reserves. This is a good time to practice "cleanup" grazing—an effective way of reducing feed costs.

Such forages as (1) unused early spring ranges, (2) regrowth on adjacent irrigated hay land, (3) refuse materials—beet tops, standing sweetcorn stover, and others, and (4) regrowth on non-irrigated hay meadows can be used to advantage. Their values or fees charged for them will range from 1c or 2c to 5c per day per head.

Here are average yearly feed costs per cow for a year:

Winter—90 days
@ 20c = ...$18.00
Early spring 45 days
@ 4c = ... 1.80
Late spring-summer
150 days @ 1.3c = ... 2.00
Fall-early winter
80 days @ 3c = ... 2.40

Total $24.20

—W. W. Heinemann, the Animal Science Department, State College of Washington, Prosser.

Northeast Area

Pasture grazing program: Most producers have adequate pasture during the early part of the grazing season but often find a shortage of this feed by July or early August. Aftermath grazing will often bridge this gap. Also, rotation of pastures increases carrying capacity.

Some producers use fall-sown rye to extend the pasture season. Where land is adaptable, this is a good practice. An average pas-

Tractor and auto fuel tanks should be kept full in cold weather, according to agricultural engineers. Filling the tank in the evening will reduce the amount of moisture which can condense overnight.

ture cost charge is $15 per head pastured.

A good roughage program is a must. Beef cow and calf programs in this area are supplemental enterprises—a means of marketing home-grown feeds. Most producers grow all their roughage and frequently all the necessary grain, buying only protein and supplements and minerals. Here are 6 daily cost-cutting rations for dry brood cows: total cost figures are for 180-day, winter feeding period.

- Legume, legume-grass hay (at least 1/3 legume) 18-22 lbs. $30-36
- Mixed legume hay 10 lbs.; corn silage 20-30 lbs. $32-35
- Mixed or grass hay, 10 lbs.; grass silage, 25-35 lbs. $30-35
- Grass hay, 18-22 lbs.; protein, 1 lb., ground limestone, 1 lb. $28-32
- Mixed hay, 10 lbs.; corn stover or straw, 12-16 lbs. $25-30
- Mixed or grass hay, 10 lbs.; pea-vine silage, 25-35 lbs. $32-34

Using the flat rate cost of $15 per head for pasture, the yearly feed cost will range from $40 to $51, depending on the type of roughage programs followed.—*M. D. Lacy, Animal Husbandry Department, Cornell University, Ithaca, New York.*

South-Southeast Area

To stay in business in this area, the commercial cowman must have a cheap but adequate supply of feed. The midsummer grass supply and the winter roughage needs must be met regularly because a serious shortage of either can cripple a cowman financially.

The commercial cowman requires grass for at least 9 months each year and it must be cheap grass. To be sure of a long-range grass supply, he keeps the size of his cow herd in line with the carrying capacity of his permanent pastures during the dry summer seasons. If he runs out of grass in the summer, his calves shrink and there is no net return.

"The Golden Rule practiced without imagination often is sheer irritation."
—Dr. Ralph S. Stockman

Here is a rather typical program for the area in and around Mississippi State College:

4 acres of better-than-average pasture land alotted to each cow and calf for a 9-month grazing period.

Start cattle on pasture, wild barley, March 1 to 15, yellow hop clover follows, then white Dutch, Dallis grass and Bermuda grass, lespedeza comes next, and will usually last until December 1 to 20.

Daily winter ration lasting about 90 days:
30 pounds silage (sorghum)
5 pounds hay
1 pound cottonseed meal

Land rent @ $5 per acre	$20.00
Hay usually clipped from pasture	5.00
Silage, (2,700 to 3,000) lbs.	10.00
Cottonseed meal	3.00
Clipping pastures, fence repair	4.00
Vaccinations and other medicines	1.00
Estimated salt	.50
Insecticides	.50
	$44.00

This program is based on spring calving February 1 to May 1. Calves are weaned November 1 and average 425 pounds. Calves are two-way slaughter or feeder. Some use a fall calving program. Calves can be moved July and August at 500 pounds or better. It costs more to winter cows.—*E. E. Grissom, Mississippi State College, State College, Mississippi.*

Report Costs of Raising and Buying Pullets

Raising a pullet to six months of age costs, on the average, about $1.62, according to detailed cost records kept by nine Illinois farmers in 1957. University of Illinois agricultural economist R. A. Hinton reports that total costs varied from $1.14 to $1.99. Death losses caused this wide difference.

Cash costs to raise the pullets averaged about $1.37. These costs were made up of feed, baby chicks, power and equipment and other items. Hinton estimates that it took about 14 minutes of labor worth about 24 cents to raise a chick to this age.

Most farmers in this cost study used buildings and equipment they had paid for in earlier years, so their equipment costs were only about 14 cents a chick. If farmers had been using new equipment, these costs would have added about 15 cents to the cost of raising each chick.

These cost figures can help a farmer decide whether he should raise his own pullets or buy started pullets now being offered in many areas. These 16-week-old birds are selling for about $1.75 to $1.85 a bird. University poultry extension specialist Sam Ridlen estimated that about 400,000 started pullets were available to Illinois farmers in 1958. —*University of Illinois*

Alfalfa-Corn 'Menu' Profitable in Lamb Fattening Trial

Rotation-fed lambs returned $2.08 each above feed costs compared to $1.76 for free-choice fed lambs . . .

Condensed from
The National Wool Grower
D. C. Dix, Utah State University

LIVESTOCK "menu-makers" of Utah Agricultural Experiment Station report considerable success in fattening feeder lambs on alfalfa-corn pasture.

Results of a three-year study conducted on lambs from the station's experimental sheep operation at Cedar City, show that feeder lambs can be fed on alfalfa-corn pastures with a minimum of loss and with sufficient weight gain to prove economically profitable to the producer.

This feeder lamb performance test will be concluded in 1959 by addition of slaughter data and packer-buyer grading results for 1958 and 1959 trials. The trials are part of a series of range sheep breeding and management experiments which have been conducted by the Experiment Station since 1943.

For the lamb feeding studies started in the fall of 1956, five breeds of lambs were tested for comparative performance. Suffolk crossbreds, Hampshire crossbreds, Columbia, Rambouillets and Targhees were used in the alfalfa-corn pasture feeding experiments.

The average weight gain for the three years just concluded was .38 pounds per day for all lambs. Lambs finished at differing rates and Rambouillets and some of the other lambs required finishing in the feed lot at completion of the pasture period.

All breeds were considered to have gained at the same rate, but the percentage of lambs grading "fat" in the various groups differed. Results in the first three years indicate it may be desirable to feed small lambs (under 70 pounds) on pastures so they will still be at weights small enough to receive feed-lot finishing.

Some of the lambs registered excellent weight gains but when averages for all three years were considered the Rambouillets were found to be in the same "con-

Reprinted by permission from The National Wool Grower, 414 Crandall Bldg., Salt Lake City 1

dition" at the end of the pasture feeding as they were at the beginning.

One half the lambs in each sub-group were given alfalfa and corn as a single free-choice ration. The other half were put on a managed rotation schedule and given corn an average of 2½ hours a day and alfalfa the rest of the time. All lambs were vaccinated with "over-eating" and "sore-mouth" vaccine before being put on the test and all lambs received "Rumella anti-bloat compound" with salt during the time they were on green alfalfa.

Lambs fed on rotation brought considerably greater economic returns than those on free-choice feed. The rotation-fed lambs returned $2.08 each above feed costs; the free-choice lambs $1.76. Losses during the three years were 2.4 per cent.

The economic advisability of shearing feeder lambs in the southern Utah area also was studied during the pasture-fattening trials at Cedar City.

The sheared lambs definitely registered a higher daily gain and were graded higher at the end of the trials but were penalized from $1.50 to $2 on the market because in the 38-day average feeding period, wool had not grown sufficiently to produce a pelt grading above No. 3. This penalty resulted in a 38-cent lower return from the sheared lambs, but the study showed it would be economically advantageous to shear lambs being fed 60 days or longer.

In the three years, losses among sheared lambs were four compared to two in the unsheared group. Other losses included one Suffolk crossbred, four Hampshire crosses, and two Targhees for a total of seven out of 379 lambs used in the three-year study.

Packer Paying for Grub Treatment

In an unprecedented move, a major meat packer has announced payment of up to $1 per head to cattlemen for treating their cattle with systemic grub killers.

This innovation is presently being studied by three other packers. Cattlemen who wish to collect the packer's payment for systemic grub treatment keep their dealer's statement for cost of the chemical. They submit this along with a statement that they have treated the cattle, when the animals are brought in for sale.

The packer will pay up to $1 per head to any owner who delivers cattle with carcasses containing less than five grubs.

—*Better Farming Methods*

Surprising Results from Pelleted Feeds

"If the cost problem can be licked, feed pelleting may revolutionize the livestock production industry . . ."

Condensed from Kansas Farmer

Dick Mann, Associate Editor

IF the cost problem can be licked, feed pelleting may revolutionize the livestock production industry.

In Kansas the largest on-farm experiment with pelleted feeds is being conducted by Herb Clutter, of Finney county. He markets 5,000 to 7,000 feeder lambs per year, starting with lambs weighing about 60 pounds average and marketing at 112 pounds so they shrink to about 106 pounds.

Two years ago Mr. Clutter put his lambs on fields to clean up roughage that otherwise would go to waste, then put them in the feed lot on an all-pelleted feed. He repeated the experiment in 1958. He reports the following results:

Labor requirements were reduced 75 per cent during the full-feeding period.

Death loss from feed causes was reduced 75 per cent to 80 per cent.

There was no feed waste.

It took lambs 24 to 28 hours to learn to eat pellets. They were immediately on full feed from that time on with no bad results.

Anyone capable of driving a truck could do the feeding as all it required was putting pellets in the self-feeders by means of a self-unloading auger.

Labor consisted of filling feeders twice weekly.

Arrangements for pelleting were made with the W. J. Small Company, dehydrating plant, at Holcomb.

Pellets used consisted of 35 per cent concentrate, 25 per cent maize stubble or grass hay and 40 per cent sun-cured alfalfa hay. The concentrate was 27 per cent milo grain and 7 per cent molasses.

Here is how the arrangement worked. The dehydrating plant used its equipment to cut and haul the maize stubble from the Clutter farm near the plant. Cost for cutting, gathering, drying,

Reprinted by permission from Kansas Farmer, 8th & Jackson Sts., Topeka, Kansas

grinding and pelleting was $23.50 per ton. Mr. Clutter reports: "It was not worth the cost as feed value but milo stubs make a better pellet than hay."

Hay used in the pellets was ground from stacks in the fields, hauled to the plant and pelleted at a total cost of $17.50 per ton. Again the dehydrating company provided equipment and labor.

Ground grain was hauled to the plant by Mr. Clutter as needed. Cost of grinding, handling and pelleting was $7 per ton. Molasses was added on basis of company's cost and varied from $32.50 to $70 per ton during the second year.

Average cost of the total pelleted feed the past year was about $38 per ton, with another $2.50 per ton added when antibiotic was used.

To come out on the high-cost feed Mr. Clutter must get .4-pound gain per day, which he has been doing. He believes this can be increased to .5 pound per day with experience and more favorable weather.

One dairy publication says at present it is believed milking cows should not be fed pelleted feeds as milk fat content is reduced. However, the report adds, with more research now under way, desirable pelleted feeds for dairy cattle may be developed.

U. S. farm people are less than 1 per cent of the world's population. But they produce one-fifth of the world's output of red meat and nearly one-third of the world's milk.

Another report says it now appears pelleted feeds may change beef cattle and sheep feeding very materially. The report then states recent steer-feeding experiments showed gains were increased 7 per cent with 14 per cent less feed when the same feed was fed in pellets as compared to having it loose.

New Weed Control Bulletin Available

Stauffer Chemical Company has just published an illustrated brochure which describes the various applications of its selective pre-emergence herbicide, Eptam.

Included are detailed outlines of the crops (food, forage, ornamentals) on which Eptam can be used advantageously and the types of weeds controlled by the herbicide. Descriptions are also provided of the most efficient application methods—broadcast, band, pre-emergence and post-emergence.

Copies of the Eptam brochure are available, without charge, from Stauffer Chemical Company, 380 Madison Ave., New York 17.

Small Farms Still Make Profits

If you have ability, you can still make a comfortable living on a small farm . . .

Condensed from

Wallace's Farmer and Iowa Homestead

Jim Rutter

THERE are plenty of small farms still operating, especially in the Middle West. You can make a good living on these smaller acreages, but it takes better than average ability.

Farm sizes continue to increase. This is natural since top efficiency comes with a farm of about 240 acres, according to many economists.

Having a farm this large means you can afford to own a full line of machinery. You can hire extra labor during the busy seasons and boost your volume easily.

But consider a small farm that includes 120 acres or less. A good operator can find several advantages here. And if the land is free of debt, it isn't hard to make a good living.

"You can't place a dollar value on the independence and satisfaction that comes with owning land," says Herb Howell, agricultural economist at Iowa State College. "To most folks, this freedom is worth a great deal."

The Marvin Keller family in Iowa county, Iowa, agree with this. This family, including 5 children, has carved a future out of 80 acres of land.

Keller may expand his farm later on, but he has proven that an 80-acre farm can comfortably support a large family.

What does it take to be successful on a small farm? There are some requirements—let's call them special skills.

Harry Mildenstien, Tama co., Iowa, farms 110 acres—about 60 acres are tillable.

"I keep a herd of 40 stock cows and raise purebred hogs," says Mildenstien. "Besides that, I'm milking 17 cows now."

He adjusts hog production to the market outlook. Some years there is more of a demand for purebred stock than others.

A thorough knowledge of buying, feeding and marketing livestock is worthwhile on most farms. And almost necessary on

Reprinted by permission from Wallace's Farmer and Iowa Homestead, Des Moines, Iowa

small farms. You'll probably need to buy a lot of feed. This means you'll normally buy services, too.

Paying for hauling or storing grain pushes the fixed overhead costs up. Avoiding some of these costs means more profit for the small operator.

Capital is usually limited so mistakes are costly. Precautions must be taken to prevent a disease outbreak. Small farm owners have lost all of their capital to an outbreak of disease.

Hitting the right market is important. And you'll realize more profit if you sell for better than average prices. For example, produce meat type hogs that bring a premium, grade A milk, or top quality eggs.

Every farmer likes to get top prices for his products. But the man on a small farm often may find it necessary to get a premium price if he is to show a profit.

Be sure you want to operate a small farm before spending money to intensify. Deciding whether or not to buy more land is not easy.

Actually, the risk of buying more land often isn't any greater than for intensifying a small farm.

There are two common ways to operate a small farm:

1. Build the volume up. Get a good livestock program. Then, make a profit by buying and marketing at the right time. Usually the man that fits this bracket is above average on knowledge of marketing.

2. Second method is to cut costs. A cost-conscious farmer will buy second-hand machinery, doesn't need hired labor, does his own repair work and so on. Gross income isn't too large, but costs are minimum.

"I work hard at cutting costs," says Keller. "My machinery isn't new, and I do most of the repairing and overhauling work right here on the farm."

Weight of ewes as yearlings just before first breeding is a fairly accurate indication of the birth and weaning weights of the lambs they will produce, according to a U. S. Department of Agriculture study.

Let's take a look at the 1957 income from an 80-acre farm in east-central Iowa. Owner of the farm is a member of a Farm and Home Development group.

Last year, this farm produced 400 meat type hogs. The pigs returned $190 for each $100 worth of feed consumed.

Net livestock increase was valued at $10,149. Value of the feed was $5,340, so livestock income over feed costs totaled $4,809.

The 80-acre farm was heavily

cropped to get maximum feed. Grain produced was valued at $3,450. Cropland included 42 acres of corn, 8 acres of oats, 14 of pasture, and 6 for the farmstead.

The rolling land is terraced and contoured. A good fertilizing program helps get high yields.

Farm and Home Development records show that this farmer made as much profit on 80 acres as many folks do on 160. Wise management made the difference.

"Specializing means you may have wide variations in the annual income," warns Howell. "If you raise only hogs, the profits may be down one year and up the next."

Having enough capital to weather the leaner years is important. Income will be more stable if your farm program is diversified.

Much the same production and marketing skills that make a small farm successful are desirable on larger farms. Both require sizeable amounts of capital for the most profitable operation. And both the large and small farms can produce a comfortable living.

Colostrum Boosts Gains in Older Calves

Dairymen may be missing a chance to sell more milk and increase calf gains if they are throwing away colostrum from their herds, according to I. W. Slater, Wyoming University extension dairyman.

Colostrum, produced for a few days after the cow freshens, is essential to give new calves a good start, Slater says. It provides needed vitamins and minerals and protects the calf from diseases and infection during the first few weeks.

Calves fed colostrum gained faster and did not get scours.

Researchers at Ohio State university saved all the colostrum from a 70-cow herd and fed the surplus to older calves. By feeding all the colostrum to calves in place of salable milk, the dairymen increased milk sales by 4,000 pounds in one year.

Older calves make good use of the rich milk too, Slater says. Calves with scours did better when fed colostrum. Researchers found that colostrum could be fed straight or preferably mixed with other milk, Slater says. *—University of Wyoming*

Chimney Smoke

by Irene Rudie

SING YOU A SONG

Sing you a song in the garden of life,
If only you gather a thistle;
Sing you a song as you travel along,
And if you can't sing, why whistle!

—Author unknown

★ ★ ★

I wish someone would invent an electric eye to let pets in and out of doors and pay no attention to children.

★ ★ ★

A truth heard on the kitchen radio: People who like to read can not be trusted to clean out the attic!

★ ★ ★

The nice thing about getting a big meal for help or company is that one can coast for a couple of days afterwards while the family finishes up the leftovers.

★ ★ ★

Overalls should be constructed like the famous "One Hoss Shay," so with extra wear on seat and knees and extra strength on points of strain they would wear out all at once and never need a patch. The time for disintegration would come while the garment is in the washing machine and not on its owner.

A very young visitor to the farm, on seeing leg bands on all the hens, couldn't understand why every chicken had a wrist watch on when she didn't have one.

★ ★ ★

If this month brings a soft, still snow, that is the time to get some good pictures for next year's Christmas cards.

★ ★ ★

There's no sweeter litany to a sleepy child on a stormy winter morning than the long list of school closings — including his own — coming to him from the radio.

★ ★ ★

Perpetually cheerful in a cold and dreary winter world is that little fluff of feathers with its happy chant, Chick-a-dee, Chick-a-dee-dee-dee.

★ ★ ★

When a farm family of growing boys is invited out for a meal, the wise mother provides a hearty snack before they leave home.

★ ★ ★

Why is it always the best cow in the barn that dies, the best white sheet that's blown down in the mud under the clothesline, the best plate that crashes to the floor?

Stop Wasting Manure

In terms of annual crop production, we are wasting over one billion dollars a year by improper treatment of our barnyard manures . . .

Condensed from Organic Gardening and Farming

ONLY half of the fertilizing value of animal manures ever gets back to the soil. The other half is stolen.

The two chief manure robbers are *leaching* and *evaporation.* Together these two forces steal much of the active nutrients in manure—one by washing them out, the other by drying them off into the air.

How can this tremendous loss be stopped? What is the best way to store manure? How should it be applied to the soil? Soil specialists all over the United States agreed on these main points as answers.

1. Spread fresh manure daily and turn it under immediately or as soon after spreading as possible;

2. Store manure in an enclosure with a cement floor to prevent leaching;

3. Provide plenty of litter or bedding to absorb liquids.

Daily Spreading

Many authorities recommend getting the raw manure into the ground immediately, plowing it under before any nutrients escape. Speed is all-important; therefore the manure spreader should make its rounds every day.

Some agronomists argue that too much emphasis is placed on adding only rotted manure. In many cases, especially in the home garden, fresh manure is often too hot and quick-acting, so rotted manure is safer to use than equal amounts of fresh. But the reason it's safer is that the rotted manure has *lost* much of its quick-acting ammonia as well as so much organic matter that the phosphoric acid and potash remaining are *relatively* increased and the fertilizer action is in better balance. However, this result is obtained at heavy cost in losses of nitrogen and organic matter, and too often of potash also. So these agronomists point out that it would be more economical to use smaller amounts of fresh manure and supplement it with rock phosphate and potash, which would result in bet-

Reprinted by permission from Organic Gardening and Farming, 6th & Minor Sts., Emmaus, Pa.

ter use of available nitrogen.

Cement Floor Enclosure

As everyone knows, it isn't always possible to spread manure daily because of the weather, time of year or other work. In such cases manure must be stored. And when it comes to storing manure, a cement floor pays for itself in one year by just about ending leaching.

The pile should be about four feet high, steep-sided and flat-topped. No cover is needed, since the manure pile usually receives enough rain to prevent heating, but not enough to cause much leaching. All authorities agree that heating or fermentation are to be avoided in order to conserve nitrogen and other nutrients.

"Give what you have to someone—It may be better than you think." —Longfellow

Importance of Litter

Storage in loose-run barns or sheds with concrete floors is also recommended—if plenty of bedding or litter is used. In this case, the manure is permitted to accumulate while the urine keeps it moist and the animals trample it compact.

Litter or bedding is valuable in conserving nitrogen and keeping the animals healthy and comfortable when it has the following characteristics:

1. highly absorbent, thus preventing loss of urine;
2. fixing capacity for ammonia and potash to prevent loss;
3. easily obtainable and cheap;
4. contains residual plant food of its own to add to the over-all nutritional value of the manure;
5. not be too coarse to prevent proper compaction or reduce animal comfort;
6. not be dusty or able to be kicked aside readily.

Opinions of Experts

From Indiana's G. P. Walker: Practical handling of manure for holding down nutrient losses and at the same time avoiding excessive labor requirements varies somewhat with the type of livestock. Most dairymen with cows housed in stanchion barns try to keep their manure hauled and spread as fast as it is made. Where cows are housed in tramp sheds with generous bedding, the manure is allowed to accumulate under tramping and hauled out and spread at less frequent intervals.

"A man is hurt not so much by what happens as by his opinion of what happens." —Montaigne

Beef cattle feeders allow the manure to accumulate with considerable bedding either under cover or in open feed lots, usually

until the particular lot of cattle has been fed out.

From Florida's G. C. Horn: The best method to store manure is to compost the manure to exclude as much air as possible. A pile with as small a base as possible is best. This type of pile need not be covered if it is properly compacted. It is absolutely necessary to use a good litter to catch the liquid portion of the animal excrement because this liquid portion contains a high percentage of nitrogen and potash. Peat moss is excellent, as are cereal straws for use as litter.

Worst Way

"The poorest way of managing manure, and unfortunately—an all too common one—is to pile it on the top of the ground outside of the barn. There it lays with rain waters washing through it which can flush out the nutrients and allow them to drain away." So comments Rutgers specialist Wallace Mitcheltree.

"Happiness is a perfume which you can't pour on another without getting some on yourself." **—Emerson**

Spreading Manure

Manure left in the pen after the animals have been removed soon dies and loses much of its nitrogen. Fermented manure can lose as much as 45 per cent of its nitrogen value when left on the field to dry. It is obvious then that manure must be turned under as soon as possible if it is to be of most value as a crop and soil builder.

Spreading manure on a cloudy, humid day is also recommended because evaporation is slowed under these conditions. Correct amounts of manure to the acre per year depend on soil, crop and region. It is generally agreed that a small amount of manure, applied annually, gets better results than larger amounts applied in alternate years.

"I can't make them out," said the woman. "They have no car or television, and she has no jewelry or furs."

"Perhaps," said her neighbor, "they just have money."

In Maryland, six tons per acre are recommended for hay and pasture crops containing less than 50 per cent legumes; ten tons are advised for corn. Normally only one application is recommended annually for each crop, usually on fields to be planted to corn.

Pennsylvania agronomists recommend plowing manure under for row crops as well as to winter grain that will be overseeded to a grass-legume mixture. The grain should be top-dressed after

the ground is frozen. For corn, potatoes, tobacco, and grass sods, 12 to 15 tons per acre are advised.

FARMYARD MANURE ANALYSIS

The average farmyard manure contains the major and trace elements in the following relative amounts:

nitrogen	1
phosphorus	0.29
potassium	1.13
calcium	0.94
magnesium	0.26
boron	0.00092
cobalt	0.0000055
copper	0.00053
magnesium	0.26
molybdenum	0.0000034
zinc	0.0043

Problem Is Misuse

Proper handling of manure is more important today than ever before. While there are fewer horses now than at the beginning of the century, the number of cattle has almost doubled, from 50 to 100 million. There has also been a corresponding rise in the number of other livestock; so the problem is not so much *insufficient* manure as *misuse* of manure.

It has also been calculated that a farmer by wise management of his animal manures can return to the soil 70 per cent of the nitrogen, 75 per cent of the phosphorus, and 80 per cent of the potash which was taken out by the home-grown plants his animals eat. This is a considerable saving when it is realized that a dairy cow gives 27,000 pounds of manure annually.

Manure is still the most common organic fertilizer used by farmers. Anything done to stop the manure robbers will pay off well.

Agriculture's Role in Plastics — Improved plastics will almost certainly play an important role in the science wonder-world of tomorrow. Chemists at the U. S. Department of Agriculture have discovered that animal fats—largely a surplus product today—can be used to convert hard, brittle plastics into permanently soft, flexible tough materials that will process into many durable, high-quality products. Some vinyl stearate—a softening agent for plastics made from animal fats and acetylene—is already being produced industrially. Other agricultural products will find wide application in plastics.

More Milk From Fewer Acres

Dairymen who feed harvested forage the year around find they can grow a 12-month supply on land they once set aside for summer pasture . . .

Condensed from Capper's Farmer

George A. Montgomery

DAIRYMEN are finding ways to make more milk from fewer acres. They know that when cows graze fast-growing rotation mixtures, feed is trampled, fouled with urine and manure, and half or more is wasted. They are switching to harvested feed the year around, and some of them are growing a whole year's forage supply on the area they once set aside for summer pasture.

Every blade of grass grown to make milk on Clarence Imhoff's rich black land in Woodford county, Illinois, is cut and put into storage at the stage of highest total feeding value. A year ago a 12-month roughage supply was harvested when none of the alfalfa was past one-tenth bloom. Last summer a little stood to half-bloom.

Bulk of this forage goes into three blue oxygen-tight silos. It is wilted before it's chopped from the windrow.

It takes a good cure in these glass-lined steel towers. Imhoff says his cows can stow away more nutrients than when they graze green grass or eat freshly chopped forage or high-moisture silage. He is a producer of machine-made milk. Power implements mow the feed, windrow it, pick it up, chop it, and blow it into storage. When the herd needs forage he pushes buttons, and electricity takes it from the silo and augers it to bunks. Power machinery scrapes manure from the concreted lot and loads it into a spreader. There is little need for pitchforks and old-fashioned scoop shovels.

The big saving in labor seems reason enough to keep cows in drylot the year around, but there is another big advantage: The Imhoff plan releases about 25 acres of high-priced farmland for the production of other crops.

First year of drylotting was 1956, when 40 acres of grass mixture supplied the herd with all the roughage it needed for 12

Reprinted by permission from Capper's Farmer, Topeka, Kansas

months. In 1957, the herd went back to pasture, and it took 40 acres just for the grazing season, tho the crop grazed may have yielded a little less.

"I judge I would need an average of 65 acres of grass to carry the herd 12 months if they went to pasture in summer," Imhoff said. "With like weather it will take 40 acres to grow harvested forage for 40 producing cows and 12 heifers, which graze a small paddock and go into the lot with cows to get extra roughage to keep them growing."

That isn't the whole story. Imhoff finds his early-cut forage, ensiled before any leaves are lost, contains enough protein for top results. He feeds no oilseed meals in the grain. His mix is 750 pounds ground shelled corn to 1,000 pounds of ground oats. The big Brown Swiss cows get 1 pound for each 4 pounds of milk they give. When protein was fed, extra milk didn't pay added costs.

Land is so high priced a man can't afford to graze it, says Norman Algrim, Iowa county, Wisconsin. He'd need twice as many acres of grass if his Holsteins were pastured in summer. He hasn't as much silo room as Imhoff. He chops a green legume mix and hauls it to the herd, which is penned in a 2-acre lot. He cuts from prebud to early bloom; says he would cut all at bud stage if he could manage.

"We have 41 cows, with 38 in milk, and 18 acres carried them until August 15," Algrim said. "At that date we had taken off three cuttings. We may go to silage the year around."

Gerhard Nass, Iowa county DHIA tester, was at the Algrim farm the day I was there. He said 40 or more dairymen in the county have gone to drylot feeding.

"It evens out the summer milk flow," he said. "Cows that are grazed spurt when they first go out. Then they slump. Cows kept on harvested feed test higher, too."

A 2-year test at the Iowa station showed that fresh-chop will produce more milk than silage. The average was 4.3 pounds more daily the first year; 5.6 pounds more the second. Cows liked the freshly chopped feed better and ate more of it. When fresh-chop was compared with pasture, the Iowa folks found there was much less bloat on the chopped feed and the yield per acre was higher.

Buying and using poor quality seed can be—and usually is—the most expensive seed in the long run.

Is this drylot way of producing milk due to expand? Vic Burcalow, extension pasture special-

ist at Wisconsin College of Agriculture, told me:

"Ten years from now it will be hard to find a top-notch dairyman who turns his herd out to pasture. That may sound strange when it comes from a pasture man, but the trend is all in that direction.

"We have tests going at the Marshfield station in which we are going after all we can get out of grass. We're comparing

One of the first things all kids learn at school is that everybody else gets an allowance.

green feeding, 12-hour strip grazing, feeding silage and hay 12 months a year. Go up and dig into the figures when they're ready for release, then tell me whether you think a man can afford pasture."

Drylot feeding has spread clear across the country in a few short years. The top dairymen are using it. I interviewed men at half a dozen colleges on the subject, and visited farms in Iowa, Wisconsin, Illinois, Indiana, Ohio, and Pennsylvania to learn of its impact on dairy production. All those to whom I talked agree on one thing: It's here to stay.

With it comes more power harvesting equipment, more silos, more paved cow lots, greater use of fertilizer for grass crops, increased use of stationary mechanical feeders and self-unloading wagons. It points to bigger cow herds, higher production per cow. It is part of the movement toward specialization and greater efficiency.

Starting from scratch after World War II, Nelson Price has worked his way up from 50-50 operator to farm owner in Seneca county, Ohio. His 120-acre farm has only 100 tillable acres. He is building soil and herd together.

Early last summer he went wholly to drylot feeding. He hauls in feed freshly chopped and puts it in bunks with a self-unloading wagon. Filling a big trench silo and haying were managed to keep the grass low in fiber, high in protein.

"I must keep quality up because I feed only a pound of grain for each 6 pounds of milk," Price said. "You can make a lot of milk that way. My cows produced from 310 to 548 pounds

Market value of farm land continues to climb to new high levels.

of fat apiece. And I have a lot less mastitis than when I fed grain for a 500-pound herd average. I have 32 cows that never have had udder trouble. That's one benefit you get from going heavy on silage, hay, and fresh-

chop and light on grain.

"I am heading toward 50 producers and the young stock needed to keep the herd at full strength. It's a good way to make a lot of milk from a little farm."

Price fertilizes heavily. When he took on the farm it wouldn't grow enough grass to pasture 30 cows. Now, seeded to a mixture of alfalfa, red clover, birdsfoot, ladino, and orchardgrass—punched up with 200 pounds of 45 per cent superphosphate an acre—it will provide forage to feed 50 milkers and replacements the year around. Price says drylotting makes that possible.

There's still a sucker born every minute. The trouble now is he doesn't have anything you can take away from him.

I found young Harvey Thompson chopping a mixture of alfalfa, alsike, and orchardgrass. He was hauling it to 38 purebred Guernseys he milks on the 100-acre farm he bought in Newton county, Indiana. Thompson believes he gets three times as much milk from fresh-chop as he could expect from grazing.

"Keeping the herd up is a great way to add size to a little farm," he told me. "I'm headed toward a milking string of 60. I'll be there when heifers that are bred and others coming on are in milk. This way I can raise the forage they need. My cows soon eat all they want in summer, then lie down or stand in the shade of big spreading oaks in my woodlot. That's the way to make summer milk."

When George A. Palmer's Holsteins grazed in Winnebago county, Illinois, he lost one or two from bloat each summer. Now he drylots the 57 in milk except for a few weeks after his sons, Lee, 16, and George, 13, start to school in September.

Last summer 22 acres carried the herd to that time. I visited Palmer in midafternoon. Cows had cleaned up their load of fresh-chop. A few were at the water tank a few yards away, but most of them were lying in the shade.

"Look at them," Palmer said. "When they fill up on good forage, then lie down in the shade, they're working efficiently. Keeping them on harvested feed gives me 25 to 30 acres more for grain crops. You get higher milk yields per acre. The cows maintain better flesh and none bloat and die.

Off-farm income now accounts for about one-third of farmer's total net income, reports the U.S.D.A.

"The idea is taking hold fast. Between 20 and 25 per cent of this country's dairymen have

gone to harvested feed around the calendar."

Bob and Dick Morris, who live 4 or 5 miles from Palmer in Boone county, Illinois, took fresh-cut feed for 50 cows and 10 springers off 36 acres last summer. That's not all this acreage put out. They got 3,200 bales of hay besides the green feed.

When growth of the alfalfa-ladino-timothy mix starts to lag in September, they haul in one load of grass to one of chopped green corn. They like their plan better than strip grazing, which they used awhile. About 2 or 3 days after cows went on a new strip, they were down 10 per cent.

About the only place a dollar is worth 100 cents now is in arithmetic.

You can't afford to make cows walk too far to pasture, so John Dane, Johnson county, Iowa, grazes when grass is near the buildings. He fresh-chops summer feed for 55 Holsteins when crop rotation puts fields too far away. He has a pickup chopper. He mows once a day, chops twice a day to keep feed from heating before it is consumed. Cows like the newly mowed feed best; like forage that is wilted better than that which cures out.

The 51 rugged, 1,400-pound Brown Swiss in J. Lin. Huber's milking string in Franklin county, Pennsylvania have access to a small pasture. Rye drilled into the sod buzzes them up on vitamins in early spring. But most of the 500,000 pounds of milk Huber produces is made by feed from silo and haymow. It is good feed—the best Huber knows how to produce. No cow gets over 10 pounds of concentrates a day.

"I want all the milk I can get from each acre of forage," Huber told me. "I can't get maximum yield if cows go out to graze. They trample down and waste too much feed that way. They don't stay out when it's hot, and grass no longer is prime.

"I'm planning to feed silage three times a day, 365 days a year. Cows must be able to eat whenever they wish.

The most common 'school yell' in the School of Experience is 'ouch'.

"We used to feed each cow the same quantity of silage. When we put more in stanchion mangers than some would clean up, we figured we had the herd up to capacity. Feeding that way, 30 cows ate 36 pounds a head daily. Then we began 3-times-a-day feeding outdoors with our new power-driven bunk auger. The same cows cleaned up close to 85 pounds apiece daily, more than twice as much."

Keep An Eye On Your Generator

A little care now and then goes a long way on this vital equipment . . .

Condensed from Prairie Farmer

YOUR generator is one of those items that you can take for granted pretty easily, because it doesn't require much attention. This doesn't mean that you shouldn't give it what little care it needs, because it will pay you well to do so.

One of the first and most obvious things for you to watch is tightness of the belt. If it is too loose, you'll have so much slippage that the generator can't run up to speed and you won't get the full charging rate. In addition to being a possible cause of a troublesome weak battery, this will also cause premature wear of the belt itself.

On the other hand, if the belt it too tight, the generator bearings are forced to carry more side-loading than they are intended to, and you can develop bearing trouble — necessitating overhaul expense that could have been avoided. Set your belt according to the manual.

This is probably a fair rule of thumb: tighten the belt until you can depress it with your thumb about ¼ of an inch from a straight line between the edges of the two pulleys. This, of course, depends upon the distance between the pulleys, so check your manual to be sure.

Next, consider lubrication of your generator. It doesn't need much — some manuals recommend 8 to 10 drops of light oil in each cup every 150 hours. For many tractors, this would only be four or five times a year—but it's not much bother and it's good business to do it. Don't over-lubricate though—it just adds to the dirt problem and can perhaps cause trouble.

Check the condition of your brushes. These little lead bars are in constant rubbing contact with the commutator, and when they wear down to nothing, your

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generator can't charge any more. When this happens, you are in danger of physical damage to the commutator by the brush carriers . . . and possible electrical damage to the generator itself.

The brushes may be about an inch square when new, but if you find them worn down to a

"Politeness is like an air cushion; there may be nothing in it, but it eases the jolt."

¼-inch length, remind yourself to get new ones because you will need them soon.

Changing brushes is usually a simple matter — just disconnect the little attaching wires of the old brushes and replace the wires for the new ones in the same way. It's difficult to give a rule of thumb for the frequency of such service, because some tractors run so much more than others.

With a tractor that runs 800 hours per year, you could probably count on new brushes once a year. With a second tractor that runs 150 or 200 hours a year, then you can run much longer on a set of brushes.

Be sure to check the condition of the commutator, too. If it is rough or uneven, it will cause excess brush wear. Smooth it by dressing it with No. 00 sandpaper while the engine is idling slowly. Be careful to blow out all the dust after the dressing is finished. Do not use emery paper or cloth, because of the carbon and metal particulars that will be left on the commutator.

These could form a bridge between the segments of the commutator—and this is also why it is important to get the dust out after dressing with sandpaper.

If the commutator is in really bad condition, you may need to have it turned down by a serviceman before you restore it to satisfactory service. If you have any question, take the generator in and ask his advice.

With commutator in good condition, new brushes installed, belt properly tightened, and some oil in the cups, you should be set

"Many people have the right aim in life, but too few pull the trigger!"

for good service. Be sure that the battery-connecting cables are kept tight, because you can burn out the generator if they aren't.

If your tractor is of fairly recent vintage, it probably has a voltage regulator to provide the proper amount of current-flow from the generator. When the battery needs charging, the regulator allows the generator to furnish its maximum charge. When the battery is fully charged, the regulator reduces the output of the generator to zero.

These regulators do not usually require much attention, and some manufacturers simply advise replacement of the regulator if it doesn't work properly. Ask your serviceman if you have any question about yours.

Older tractors did not have automatic voltage regulators, and many tractors in use have a special switch which allows you to control the charging rate of the generator. With a battery that is fully charged, you set the switch at the normal position. If you feel the battery needs extra charging, you set the switch at the extra charge position.

This switch is usually incorporated into the light switch, so the generator also charges more when the lights are on. While this manual system is a satisfactory arrangement, it requires more of your attention, and you always stand the chance of letting your battery get low—or of overcharging it. Since there is no easy way for you to tell you are overcharging, be especially careful about checking the level of battery water, because you can boil away the water when you overcharge. Running your battery low on water, of course, can shorten its life considerably.

Farm Food Cost — An agricultural economist estimates that both farm and city families spend an average of 31 per cent of their consumption dollar for food.

Farm family expenditures for food are, on the average, lower than those of urban families. But when taken as a proportion of a smaller total, the food expenditures are the same, percentagewise, as for the city family.

Hens Dislike Yellow Hose — When poultrymen learned that chickens damage different colors of hose used to connect waterers with the main supply line, they finally tried small diameter hose in a bright yellow. While some of the other colors of hose were damaged to the extent that they had to be replaced, the chickens avoided the yellow hose entirely, and there was no trouble.

—*Poultry Tribune*

Mechanized Cotton

Here are some practices which will prove beneficial in harvesting next year's cotton crop . . .

Condensed from Texas Farming and Citriculture

George McBee, Extension Agronomist

IF you plan to harvest your cotton mechanically next year, or already own a mechanical cotton harvesting machine, several practices can be followed which may prove highly beneficial.

Clean the fields of hidden obstacles such as rocks, chunks of wood, roots, etc. that may interfere with operation of the machines. Arrange fields to provide for rows as long as possible. This will help to reduce some turning. Space should be provided at the end of the rows for turning and should be fairly smooth and free of grass and weeds.

Space row widths and set planters for widths that will fit the harvesting machine. Normally row widths of 38 or 40 inches are satisfactory with the 40 inch spacing more desirable.

The rate of planting should be adjusted to try to obtain a plant spacing of 3 to 4 inches between plants within the row. Usually about 30 pounds of seed per acre will give this spacing. There may be some exceptions under dryland conditions. Uniformly close spaced cotton normally has shorter limbs and the fruiting is higher off the ground.

A cropping program to include the return of an organic matter crop to the soil is desirable. This will aid in obtaining better structure and help reduce clodding and rough soil. Practices should

Smugness develops moral and mental bankruptcy.

be followed to obtain good stands such as observance of soil temperatures at planting time, use of rollers and press wheels where applicable, fungicides, etc.

Normally, open boll varieties of cotton lend themselves to use for the picker type machines whereas semi-stormproof and stormproof varieties are planted for stripper type machines. At present, no particular variety can

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be recommended as best for machine harvesting.

Control of grass and weeds is essential to avoid interference with machine operation and also reduce the possible lowering in grade of the cotton. Flame cultivation has been used successfully and economically in some cases as well as chemicals for grass and weed control. During cultivation the sweeps should be set to leave a slight ridge at the base of the plants to allow for trash and falling leaves to collect in the middles.

Good defoliation is usually essential for mechanical harvesting This results in a cleaner job of harvesting and reduces leaf strain. A guide for defoliation published by the extension service is available and describes the use of defoliants and dessicants.

The man who wants to do something finds a way, the other finds an excuse.

Humidity at the time of picking as well as proper moisture control on the machine will have an influence on grade. Generally speaking, humidity conditions are favorable for picking after 9:00 a.m. Under proper conditions, picking tests have shown machine picked cotton to be equal to hand picked cotton in grade. Poor machine picked samples of cotton are often the result of picking when the cotton is too wet. Operators should be properly trained.

Some provision should be made for periodic cleaning of the picker spindles and machine. Failure to do so sometimes results in greasy, dirty or stained bales.

People will believe anything if you whisper it.

Proper machinery adjustment will also help eliminate some of these difficulties.

Centering of the picking or stripping units on the rows was also pointed out to help eliminate "barking" the plants and putting more trash into the picked cotton. Driving at speeds too fast in high yielding cotton results in waste and loss.

Harvesting with machines compares favorably with hand picking. Other factors such as new developments in trailers and avoiding tramping in trailers improve grades of cotton.

New Backfat Tester — A machine that uses ultrasonic (very high frequency) sound waves to determine the depth of back and depth and width of loin eye muscles in cattle and hogs has been developed recently. USDA scientists think the machine will be particularly useful in both livestock marketing and breeding work.

You'll Get More Money from Clean Eggs

The "how" to produce clean eggs . . .

Condensed from Wisconsin Agriculturist

DO YOU have trouble with eggs getting dirty? If so, more than likely you have nest trouble—too few nests or not enough straw in them.

Make sure nests are roomy, cool and well ventilated. Either provide 20 individual nests or one 2 x 10-foot community nest for each 100 birds.

Community nests seem to reduce the percentage of cracked and dirty eggs and are becoming more common. Roll-away nests accomplish the same thing and are preferred by some producers.

Keep nests full of straw or shavings. That seems a hard thing to do, but it is a must. Chickens soil the nesting material or scratch it out. However, you can't get clean eggs with dirty nests.

Gather Eggs Often

Gather eggs often, at least three times a day. Cleaning nests frequently and keeping hens out of the nests at night also helps.

Cracked eggs are another problem and plenty of straw in the nests is the best answer to that. Straw cushions eggs when they are laid and keeps chickens from tramping all over them.

Cracks and checks are worth only about half as much as other eggs. Poultrymen can't afford that loss.

There'll still be a few dirty eggs in every pail no matter what you do. These have to be cleaned.

Most egg buyers prefer that dry methods of cleaning be used. A sandpaper buffer or a piece of steel wool works pretty good. However, this is time-consuming because you have to handle each egg individually.

A small sanding disc attached to an electric motor speeds up the process. But, care must be taken to keep from breaking some of the eggs.

Several commercial dry cleaning machines are available. Most of these remove the bloom or outer part of the surface of the shells and may weaken them.

There's been a lot of talk that cleaning eggs by washing spoils them. This may or may not be true. It depends on how much

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you wash them.

If eggs are correctly washed in a solution containing an accepted germicide, spoilage is unlikely. However, when a good germicide isn't used or it's not used correctly, spoilage organisms thrive and egg quality declines.

Water activates spoilage organisms present on the eggs and they penetrate the shell. In addition, many organisms are washed off and remain active in the washing solution so that contamination is spread to every other egg exposed to this solution.

This condition brings about heavy losses where large numbers of eggs are washed in the same solution.

The National Safety Council cautions that lack of electrical equipment on a farm tractor doesn't absolve the farmer from the responsibility of carrying warning lights. A lantern, combined with good reflectors, can be a big help in warning approaching cars.

Another egg washing hazard is that of partially cooking or congealment of the egg white. This is mainly due to exposing the eggs to hot water for too long a period.

Some producers use regular detergents, household soaps and other chemical cleaning fluids. Frequently these give the eggs a bad flavor or leave an undesirable odor. Other improper cleaning compounds leave chemical deposits on egg shells, making them unfit for marketing.

Washing eggs saves time, especially if you use the immersion method and wash a basket of eggs at a time. Here's a good way to do it:

Wash Eggs Right Away

Wash eggs in a 110 to 120 degree detergent-sanitizer as soon as possible after gathering. Change the solution after six or seven baskets. If less than six baskets are to be washed, change the solution every day.

The intelligent way to drive is at a speed safe for conditions; any other method shows immaturity and poor judgment.

Don't rinse eggs after immersion. The sanitizer seals the egg pores and prevents evaporation and egg contamination.

If a scum or foam is left on the eggs, dip them in another solution of the same strength and temperature.

Provide plenty of nests, keep them full of straw and throw out any wet litter.

If you wash eggs, use a detergent sanitizer. Otherwise dry clean them. You'll have more top quality eggs and will be able to sell more eggs at a higher price.

Take The Risk Out of Hog Raising

Quarterly farrowing, big litters of meat hogs, good feed, and disease control make a profitable hog business . . .

Condensed from The Farmer

Thomas A. Doughty

HOG raising doesn't have to be a gamble, say Nels Dovre and son, Ralph, Yellow Medicine County, Minnesota. They were sure enough of this four years ago to make hogs their sole livestock enterprise. They now market more than 1,000 hogs a year.

The two farm 700 acres in partnership. Of this, 160 acres was bought by Ralph when he returned from service four years ago. His father, who had bought the adjoining 160-acre home farm in 1940 and since added 380 acres to it, had been a dairyman as well as beef and hog feeder. But, with 700 acres now to farm, time and labor were big factors for the two to consider in their farming operation.

After careful consultations at their local Farm and Home Development Program meetings—with University farm management specialists and their county agent—their decision was on a corn-hog program. A heavy rotation of corn and other row crops, properly fertilized and managed, would return the most production per acre on that large an acreage, considering the equipment and labor they had available.

Hogs would fit well into this kind of a program. They could sell or market all their corn, or part of it, depending upon the year-ahead outlook, through hogs. Hogs would average a high hourly return for labor. And, a specialized hog program could be started without a costly investment in new buildings and equipment. The low investment and quick returns especially appealed to Ralph, starting on borrowed capital.

Now that the Dovres have four years of specialized hog raising behind them, they're convinced that much of the risk that often faces many "inners and outers" can be eliminated. They started with 600 head of hogs marketed the first year, but passed the 1,000 mark a year ago. The non-risk factors they consider the most important are:

Multiple Farrowing

They farrow four times a year

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(January-February, June, August-September, and November-December.) This gives them more chance to adjust their hog production according to the outlook ahead. More litters per year can be farrowed from no more or even fewer sows than with once or twice-yearly farrowing. More attention can be given to the breeding, care and management of hogs farrowed in smaller groups—a factor the Dovres believe pays out in economical gains and output of pork per hour of labor. Their labor, plus that of a hired hand, is more evenly distributed through the year.

Multiple Marketing

With a multiple farrowing system goes a multiple marketing system. The Dovres sell when their hogs are ready—200 to 220 pounds. With hogs ready to sell at quarterly intervals, the risk of getting all of them on a down-trend market is remote. They're bound to hit peaks with at least part of their hogs each year, and they don't have to sell under—or over-finished hogs to do it. In 1957, their average price per hundred-weight received was $18.50, including cull sows sold as well as 1,000 market hogs. For 1958, their records show an average price of more than $20 per hundredweight.

Their hogs are sold on a grade-and-yield basis. At least 70% of them this year have gone as No. 1's and at 2-4% over standard yield. Their 1957 farm management records showed a $12.50 per hundred-weight cost of production including $1.10 corn, other feed costs, sow costs, veterinary expense, equipment and building costs, depreciation and insurance. Feed costs per 100 pounds of pork produced in 1958 will be reduced to around $8. Improved feeding efficiency accounted for much of the cost reduction.

Big Litter Averages

The more pigs per litter, the lower the cost per head, point out the Dovres. This counts most at a time of low marginal selling price they add, but pays off any time. They've been averaging nine to ten-pig litters, raised. And that's with 110 litters farrowed each of the last two years. Good breeding, balanced and fortified rations, farrowing stalls, heat lamps and disease control all are factors in getting good litter size for them. Only 12 pigs have been lost from more than 2,500 born in farrowing stalls the last two years.

Meat-Type Breeding

With a growing consumer demand for "meatier" pork, it made good sense to the Dovres to set their breeding standards accordingly. They've kept their own selected females each year and are buying purebred, production-

tested, meat-type boars. They first bred their Duroc-Hampshire crossbred sows to a Yorkshire boar, chosen for his meat-type conformity, pedigree litter size, and his record of gain rate and feeding efficiency. The following year, a Poland China boar was picked, then a Duroc, and this

Don't guess! Keep dairy records.

year back to a Yorkshire. Gilts are selected by the same standards, and are bred to farrow at a year of age—when they are mature enough to farrow large litters and be good mothers.

No gilt is given a second chance if she fails to produce and raise a sizeable, thrifty litter her first farrowing. Pigs from the largest, best-doing litters are ear-marked, and records kept accordingly. Most sows farrow two to three litters, but none are kept more than two years. Sows and gilts are separated at all times. With the multiple farrowing system, only 25 to 35 sows are bred at a time, depending on the seasonal outlook. If extra gilts are kept, they may or may not be sold ahead of farrowing time.

Good Feed, Disease Prevention

These are big non-risk factors that make a five-month period from farrowing to market possible for the Dovres. Their sows are on rotated alfalfa pastures during spring-summer-fall gestations. In winter, they get a bulky feed containing ground oats and alfalfa, fed at least 20 rods from the buildings to give them exercise. Both sow and pig rations are balanced and fortified.

Pigs are started on a pelleted creep feed the first week, then later switched to a complete, ground and mixed ration. The latter varies from 16% protein at six-weeks weaning age to 10% as the hogs near market weights.

All pigs are vaccinated for cholera and erysipelas, and sows get an erysipelas booster shot a month before farrowing. Pigs get intramuscular shots of iron the first two weeks after birth. All feeders are placed on concrete floors, although some of the pigs run on nearby alfalfa pastures during summer months. However, those raised strictly in confinement are showing increased gains, and at less cost.

As mentioned, low building and equipment investment is another reason the corn-hog program is working well on this farm. Buildings on the farms the Dovres bought were built for general livestock farming. Other than those on the Dovre home farm, they were just not suited for an expanded dairy or cattle operation. But conversion for hog raising and corn storage was

simple and inexpensive. Thus, chief outlays have gone for conversion or repair materials—less than $3,000, including concrete floors and farrowing, feeding, watering equipment.

All pigs are farrowed on Ralph's farm in a 20 x 48-foot building, once a laying house, but now equipped for year-around farrowing. Stalls have plank floors to keep sows off the concrete. They can be removed for easy cleaning and sanitation. The building is insulated and ventilated, and has an LP-gas heater and fan at one end for added warmth during winter (50-60° F.) During hot weather farrowing, Ralph starts a sprinkler hose in front of a 28-inch fan. This blows a fine mist through the house, keeping sows and pigs cool and comfortable.

Sows are kept on this farm during gestation, while gilts awaiting breeding are on the home farm. Also, some of the pigs are finished for market on the home farm, but most of them are grown and finished at the building site across the road. Here, a 36 x 50-foot barn was converted for housing and feeding.

Stanchions were removed and concrete feeding floors poured, both inside and outside. Two self-feeders, one holding 400 bushels of ground feed, the other 200, were built against the inside walls of the barn. Automatic waterers also were installed, and 50-bushel self-feeders placed on the outside floor. All feeding is done with a self-unloading auger-wagon. The mow of the barn is used for bedding storage and for green, leafy hay, fed during winter.

With the outlook pointing to more hogs on the market this spring and fall, the Dovres purposely bred their early-fall gilts a month earlier. Normal farrowings were scheduled for November-December, and for January-February. June farrowing may be eliminated or drastically reduced, depending upon forecasts.

"We're not sure yet about next fall," said Mr. Dovre. "We feel there should be a cut-back on hog numbers next year, even though we are specializing. My son-in-law will soon join our partnership. We agree that our long-term production should be upward, however.

"The corn-hog program is versatile," he added. "We can sell corn either way—through hogs or as grain. We prefer feeding it to hogs as much as possible. We try to keep a year's supply of feed ahead—until we are sure of the new crop each year, then start to liquidate it. We may also feed cattle again in the future, to help consume surplus grain, but hogs will be our main enterprise."

HERRINGBONE
Cow Barn Fashion For The Future

Labor-saving devices and unique positioning of cows help take the hard work out of dairying in this new type of milking parlor . . .

Condensed from Nebraska Farmer

Larry Mack

"YOU talk about labor savers —this is it!"

That is just one of a raft of enthusiastic comments that George Cook of Lincoln, Nebraska, uses to describe his new 12-stall herringbone milking parlor, built last May.

"This kind of parlor is new in this country," says Cook, who owns the Geo. Cook Construction Co. of Lincoln, "and as far as I'm concerned, it's absolutely the best there is."

Cook gets backing for these statements from his herdsman, Glenn Olson. "This setup takes all the chores out of milking," Olson points out.

The "herringbone" milking parlor gets its name from the unique positioning of the cows in the milking parlor. Instead of standing parallel to the central milking parlor, the cows stand at an angle—similar to the angle of the threads in a herringbone weave. Thus, the first cow's belly is against the next cow's neck and the second cow's belly is against the first cow's hips.

There are no partitions between the cows; except for a gate at each end of the series of six stalls, the cows hold themselves in place.

This "hip to belly" positioning of the cows gives rise to two big advantages for the herringbone parlor. First of all, it saves space. Cook's 30- by 18-foot building is designed for 12 cows. With a gate or walk-through parlor, only six cows could be handled in a building this size. And, since there are no partitions between the cows, stall cost is less, too.

Reduces "Walking Time"

Secondly, it cuts down on the "walking time" of the operator during milking. The head, shoulders, front feet and belly of the cow—the parts you're not interested in at milking time—are headed away from the milking pit. All the operator sees is the

Reprinted by permission from Nebraska Farmer, 1420 P St., Lincoln 1, Nebraska

part of the cow he's interested in —her udder. Therefore, he does not have to move as far to wash the cows' udders or change the milking units.

Actually the cows' udders are only 3 feet, 2 inches apart—a total of 19 feet for six cows. The minimum distance between two udders in other types of milking parlors is 18 feet.

Cook has made operations as automatic as possible in his setup; nothing is done by hand that can possibly be avoided. For instance, feed is automatically conveyed through pipes from a 4-ton bin to hoppers above the feed bunks at each stall. Most systems with this kind of setup then feature hand cranks so the operator can let down measured amounts of feed to each cow.

Not Cook; he's gone one step further. A tripping device that will let down 2 pounds of feed at a time is built under the hopper at each feed bunk. Tube-enclosed wires—similar to speedometer cable—run from each tripping device to the end of the milking parlor. To let down feed to a cow, all the operator has to do is pull a wooden knob on the end of one of the wires. One pull and the device trips and 2 pounds of feed tumble into a bunk.

Vacuum System Runs Doors

Operation of the doors leading in and out of the parlor is a pretty slick affair. The sliding doors work off the vacuum system that runs the milker; so all Olson has to do is move a little lever in order to open or close a door.

Comfort is another feature of Cook's parlor. Vents in the milking pit deliver cool air in the summer, warm air during cold weather. The tiled parlor is also completely insulated. Warm water is piped to two hoses on each side of the parlor. These hoses are equipped with sprayer nozzles to help in washing down the cows' udders. After the udders are sprayed, they are sponged down with warm water containing a disinfectant.

Timber requirements are expected to increase 59 per cent by the year 2000.

At present Cook is milking about 100 Holstein and Brown Swiss cows; and two men can handle all the milking and cleaning up operations in just about 2 hours. "We should be able to milk a cow a minute easy," says Olson, "and we don't have to hurry much either." In one timed test, when the parlor was first completed, two operators were able to milk 54 cows in 42 minutes.

Here's a rundown on the sequence of milking operations in this new type of parlor:

First, the milking units are assembled and readied for the sows and the milk lines flushed out in place. This "in-place" flushing is done before and after each milking; the lines are torn down for thorough cleaning only once a week.

When things are ready to go, Olson pushes the vacuum lever and the entrance door on one side of the parlor slides open. As the first cow rushes into the parlor, Olson pulls the feed cable that releases feed in the farthest bunk. As soon as this cow reaches that bunk, he pulls the second trip and feed drops down in the second bunk for the next cow.

Can Identify Cows

The cows go right past Olson so he can identify each one and give her the right amount of feed. And since only the farthest feed pans are filled as the cows enter, they are not tempted to stop and loiter. When six cows have come in, Olson pushes the vacuum lever again and the sliding door closes.

He then pulls the metal gate shut behind the last cow. This forces the cows against each other so they are in the right position. The same process is repeated for the six cows on the other side of the parlor.

As soon as all 12 cows are in, Olson and his helper begin washing down the first six cows' udders. Each man handles six cows, three on each side. When the first side is washed, the milkers are put on the cows and the second side is readied for milking.

When the cows on the first side have been milked and the milkers switched to the cows on the other side, Olson pushes the vacuum lever to open the exit door and turns out the cows on the first side. Six more cows come in to take their places and the whole process is repeated.

No Problem with Kicking

Another advantage of the herringbone milking parlor, according to Cook, is that there's no kicking. "Even the worst kickers don't act up in these stalls," he says.

Olson points out that it's easy to get new heifers used to the setup. "Actually," he says, "we had more trouble with the old cows when we switched from stanchions to the herringbone system than we have had with first-calf heifers."

"Thinking is the hardest work there is, which is the probable reason why so few engage in it." —Henry Ford

Evidently Cook isn't the only one who thinks he's got a pretty good setup. People have come from all over the United States and Canada to look at it. "I figure that around 2,000 people have gone through our parlor,"

he says, "since we started operations last May."

Cook sums up his feelings on the herringbone system this way: "If a farmer wants to milk cows the easy way—and not kill himself with hard work—this is the answer."

DDT-Resistant Flies May Still Have Some Weaknesses

Flies that can live through a DDT attack may not be quite as tough as people once thought. University of Minnesota research shows that in some cases, treating with low doses of DDT can cut reproduction of "DDT-resistant" house flies by about a third. Entomologists split a strain of DDT-resistant flies into three groups. One they treated with low levels of DDT, one they sprayed with Diazinon—another insecticide—and the third was left untreated.

Flies living through the DDT exposure had fewer females laying eggs, averaged fewer eggs per female and had more offspring die before reaching maturity than did untreated flies. Result: Each 100 DDT-treated females produced about 9,800 adult flies, or 33 per cent less than each 100 untreated females. Spraying with Diazinon reduced the number of new mature flies from DDT-resistant females by 21 per cent.

Curiously enough, female flies from a DDT-susceptible strain—but still surviving DDT or Diazinon—produced slightly more new adults than did untreated flies from the same strain. So in the two strains studied, reproduction slow-up from insecticides was solely a characteristic of the resistant insects.

This information so far is of more value to scientists studying the complexities of insect life than it is for controlling house flies. Even 9,000 new flies from every 100 females is a high enough reproduction rate for flies to be a nuisance.

DDT resistance in flies builds up this way: In large fly populations, some individual flies can withstand the toxic effect of DDT. These flies produce offspring capable of withstanding a slightly stronger dose. This process continues with each new generation until the population is composed almost entirely of DDT-resistant flies.

Because of this resistance, DDT is not as useful in fly control as it was at one time. Fortunately, though, DDT-resistant flies can be controlled with other insecticides, such as pyrethrins, Diazinon, Korlan and malathion. *—University of Minnesota*

Ancient Beekeeping of Japan

At one time in Japan, a man could become rich on the income from 10 hives of bees . . .

Condensed from
Gleanings In Bee Culture
Tanji Inque, Bee Culture Laboratory,
Suishoen, Moriyama, Nagoya, Japan

I AM going to tell you about the ancient beekeeping of Japan and its history. It is a pity that we have no perfect book on the history of Japanese beekeeping.

About 1300 years ago (B.C. 720), in the age of Emperor Kohgyoku, Crown Prince Yohoh of today's Korea brought back one bee colony from Kudara, and kept them in the mountain named Miwa in the Yamato district. It was the first trial of beekeeping in our country so far as we know, but to our regret, it is said that trial ended in failure.

It is doubtful if the native bees lived in our country before the Crown Prince kept bees. However, there is almost no difference between the native bees of Japan and the bees of Korea, so they are looked upon as the same kind of bees. I suppose they flew from Korea, or they were brought to Japan by someone.

The old botanical book, the Honsoh kohmokukeimoh, written by Mr. Ranzan Ono, in B.S. 1802 says as follows about honey and how to separate honey, in the chapter on beekeeping.

"If you find a swarm of bees in a hollow space of an old large tree, or among large stones, take the honey combs in September or October, cutting down the tree or taking off the stones, and put the combs into a cloth bag and press it and you will get pure honey."

The ancients called it "Kimitsu" or "Ishimitsu," which mean natural honey which people got from the colony in the hollow space or among the stones.

It was the best and most precious honey of those days. On the other hand, "Kaimitsu" or "Iemitsu" was what they called the honey which they took from colonies at home yards.

How Did the Ancient People Catch Wild Bees?

We can find out about it in the book, the Nipponsankaimeisanzue, written by Mr. Tessai

Reprinted by permission from Gleanings In Bee Culture, Medina, Ohio

Hirase in the fifth year of Hohreki (B.C. 1754), as follows:

"If you want to catch bees, make first of all, a tub or a box, and pour *sake* (a kind of Japanese liqueur) and sugared water into it, and make many small holes in its cover. By putting it near the place where bees live, they will enter it, and when most of the bees enter, you take it home and hang it at the eaves."

In those days people called bee hives, "golden home," or "farmer's gold mine," because honey was so transcendently expensive that farmers could become rich by breeding bees, and some people could make their living by keeping 10 colonies; of course, it was the old-fashioned beekeeping.

In the swarming season, people put or hung some empty box hives here and there, and swarms of bees would enter them. People called them "Machibako." (It means the box which awaits and attracts bees.)

How Did People Keep Bees?

Old people had no knowledge of bees, and so the system of beekeeping was a very primitive one. They kept bees in various empty boxes or barrels which people had in their houses, so bees built their combs as they liked, that is, as they did in the natural condition, in a hollow space of a large tree, and lived as they wished, so people could not observe bee life as we do today.

If you recall the straw skep used in Europe, the fall pot hive used in Kashmir, or the log gums in South America, you will be able to understand our old system of beekeeping more clearly.

In Japan, straw skeps are seldom used, and there is no producer of them. However, some beekeepers in the southern part of Japan have used wall basket hives which are made of bamboo and clay like a type of skep.

So, the yield of honey was very small. People got honey only once a year, in fall (autumn), and it is said they could obtain honey only 4 k.g. (about 9 pounds) from a colony.

The Sources of Honey

It was gathered from wild honey plants in the mountains and fields. Some vegetables which people cultivated for their food contributed some nectar for bees.

The tongue of slander slays three: the speaker, the spoken to, and the spoken of.

The kind of bees which were kept in the old system was the Japanese honeybee. The Japanese honeybees are very gentle compared with the European honeybees, and good producers of beeswax, but, to our regret, they are very timid; for example, when they are surprised at some

sounds, they make sounds, sah . . sah . . sah . ., and when they are attacked by hornets or robber bees, they would often flee so we cover the hives with straw mats or thick clothes, and put them in quiet places. It is very difficult to keep the Japanese honeybees and the European bees in the same yard. And what is worse, we cannot use the comb foundation of the European bees for them, because the Japanese honeybees are much smaller than the European bees. We have no producers of the comb foundation for the Japanese honeybees in Japan now.

For the past 10 years, hay yields have averaged only about 10 per cent more per acre than was the case 70 years ago.

To tell other peculiarities of them, they do not gather propolis and do not fight enemies as the European bees do very often. The capping of drone cells has a small hole in its center. It is impossible for us to produce hybrids between the Japanese honeybees and the European honeybees.

Diminution of the Japanese Honeybees

The Japanese honeybees have been decreasing in numbers as the European beekeeping develops and the European bees increase, for the Japanese bees have many weak points in comparison with the European bees.

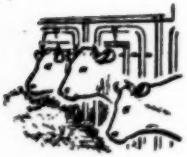
In the sixth year of Meiji (about 87 years ago), the European beekeeping was introduced to our country for the first time with the bee book, "The Doitsu mitsu bachi yoh hoh." After that the Italian bees were imported from America, and as it was proved that they were superior to the Japanese honeybees, the number of beekeepers of the Italian bees became larger and larger. From the end of Meiji to the age of Taishoh, beekeeping of Japan was its best, and then the price of one colony was higher than that of a horse. So the government made the rule to control such an absurd price.

It is only about 60 years since the European beekeeping was largely introduced to Japan, the European bees (*Apis mellifica*) expelled the native bees.

Savings in feed alone often more than pay for the cost of keeping dairy records.

Now, almost all beekeepers are keeping the Italian hybrid bees, using Langstroth style equipment. Last of all, we Japanese bee researchers are very happy to know not a few world bee researchers have been interested in the Japanese honeybees and are studying them.

How To Ventilate Your Dairy



Protect both cows and barn with proper fans and air inlets . . .

Condensed from Electricity On The Farm Magazine

Lee Wetherby

CLEAN fresh air in the dairy stable during the winter months is as important in the management of your herd as balanced rations, good bloodlines or quality roughage. Each of the factors which a dairyman considers in caring for his cows is aimed at increasing production to get more milk per animal. At the same time he tries to cut costs to allow a reasonable margin of profit. This is the constant battle for efficiency.

Ventilation Benefits Twofold

A well ventilated stable can help you with both problems. It will allow maximum production from your herd by maintaining a healthful, even atmosphere and cut the costs of building and equipment maintenance and repair. As a bonus you also get nicer working conditions.

There are many farmers who will flatly state that their ventilation system paid for itself by increased production and the saving of maintenance costs in one year, and can prove it.

Let's look at the problem of an unventilated stable to see what we have to solve. First we know that a barn full of cattle produces a lot of heat. This is a constant amount which could be utilized to keep the stable warm and easily regulated if outside temperatures were constant. But they are not. The 1000 pound cow gives off two gallons of water per day in her breath which saturates the stable air and starts dripping from stanchions, ceiling and windows.

Unless these unfavorable conditions can be controlled, dairy cattle will be nervous and uneasy resulting in their going off feed which drops their production. They also are easy prey for any respiratory disorder which may appear. This is especially true with calves.

This same warm high-humidity air can attack your stables and equipment with equally destructive force. Moisture condenses on the ceiling, sidewalls, windows and equipment in the

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barn. This condition remains all winter while the cows are stabled. Rusting of metal equipment is soon evident. Siding and supporting timbers deteriorate very fast and paint peels.

In addition the warm, stuffy atmosphere is filled with odors which cling to the dairyman's clothing. He carries these into the house, making unpleasant conditions in the home as well as in the stable. If milk is exposed to this stable air it too will absorb odors and flavors.

Strive for Ideal Conditions

Many studies have been made to determine the ideal barn temperature and humidity. Indications are that a 50° F. temperature and humidities below 75% are best. Therefore, a fan system which can create these conditions under varying weather conditions w i t h o u t creating drafts is the answer to the ventilating problem.

The two basic parts of a ventilating system are the exhaust fan and the inlet system. The fan draws the warm, humid, odor-laden air to the outside. The inlet system lets the cool, clean outside air flow in.

The exhaust system should be large enough to ventilate under the most adverse conditions. This will be when the weather outside is warm and humid. General recommendations are for the use of from 80 cubic feet per minute per 1000 pound cow in Northern States to 200 cubic feet in more temperate areas.

Fan Location

The fan should be located on the side of the barn away from prevailing winds to prevent back-drafts which cut down the efficiency. If more than one fan is used in a long barn they should be separated so each fan will ventilate about half of the stable. Otherwise locate two fans side by side, one controlled by a thermostat. This gives positive air movement all the time.

Ninety-six per cent of all United States farms are family operated.

One more variable may be provided at the exhaust fan if your farm is in the cooler climates. That is a chute from the fan to within 18 inches of the floor with a hinged door in the top so that in extended cold periods you may remove air from near the floor and conserve the heat to maintain a 45-50° temperature. In warmer periods the hinged door may remain open and the air will be taken from the ceiling, thus reducing the temperature more rapidly.

Every exhaust fan should be protected by a screen to prevent animals or persons from coming in contact with the blades and a shutter to prevent back-drafts

when the fan is not operating. A hood on the outside of the barn over the fan opening will also prevent back-drafts.

Inlet Design Important

The next consideration of the ventilating system is getting the fresh air into the stable without drafts on the cattle. This can best be accomplished by having hooded inlets built through the outside walls on all four sides of the stable, or slots built into the stable ceiling around the outside walls so the air is drawn from the mow above.

About 20 square inches of inlet per cow is required to supply the necessary fresh air. Inlet openings may be purchased ready for installation or built on the job. In either case baffles should be used to prevent the incoming air from falling on the backs of the cows. For control of the wet spots in the stable, place inlets so fresh dry air is drawn through them to remove the moisture.

Give Consideration to Wiring

Wiring to the exhaust fan should be protected by a time delay fuse rated at 1¼ times the name plate ampere rating of the motor if overload protection is not built into the motor by the manufacturer. Some care should be given the motor periodically to keep oily dust from accumulating on it and the fan blades.

These recommendations are, of necessity, general in nature and will vary with your locality or the type of system you install. For more detailed instructions for your locality call on your County Agricultural Extension Agent, Vocational Agricultural instructor, your power supplier Farm Service Department or a dependable local ventilation dealer.

Control of Air Sac Disease in Broilers

Air sac disease, or chronic respiratory disease, now can be completely controlled in broilers through high level administration of the broad-spectrum antibiotics, Terramycin and Aureomycin. Cost of these drugs has heretofore prohibited their use for this purpose. Now, it has been discovered that addition of terephthalic acid to the feed increases the effectiveness of Aureomycin at least four times. This makes use of Aureomycin practicable in controlling air sac disease. Terephthalic acid has no action against the disease but has the capacity to increase absorption of antibiotics from the intestinal tract into the blood stream. —*Feedstuffs*

Social Security Is Important To You

Are you about ready to stop farming and retire? Do you know whether or not you are covered by social security? This article will help answer your questions . .

Condensed from Tennessee Farmer

STATISTICS show that the majority of our population knows very little about social security, although it is undoubtedly the average family's biggest financial asset. Many people mistakenly believe that they need not be concerned with social security until they are at or near the age of retirement.

We asked a field representative of the Social Security Administration, to give us the answers to these questions concerning some frequently misunderstood phases of social security.

Who is required to file self-employment tax returns for Social Security purposes?

The Social Security Act states that any farm operator (young or old) must file and report his self-employment income with the U. S. District Director of Internal Revenue if his net earnings are $400 or more for his taxable years ending after 1954. Some farm operators think that filing these self-employment returns is optional—that they do not have to file if they don't want to. Such thinking is incorrect. You are required by the law to file and report your net earnings if such earnings amount to $400 or more.

Is it true that, if you pay social security tax for two years, then you are fully insured to receive social security payments, whether or not you continue to pay the tax after the first two years?

Such a belief is definitely incorrect! The amount of time you must pay the social security tax in order to qualify for payments at retirement may be as low as 1½ years or as high as 10 years. The amount of time you need will depend on your age.

Does social security pay benefits only to people over 65?

This is one of the most costly misunderstandings. Besides retire-

Reprinted by permission from Tennessee Farmer, 1529 Demonbreun, Nashville, Tenn.

ment benefits, Social Security makes monthly payments to the surviving widow and dependent children, or dependent parents, if a covered wage earner dies.

Are social security checks sent to you automatically when you become eligible?

No, you or your family must apply for payments.

Where must one apply for social security payments?

Application for payments should be made through your nearest Social Security District Office. If you do not have the address, it may be obtained from your local post office.

There are minute men, wait a minute men and last minute men.

Even if you don't need the money, can you collect social security benefits on the retirement or death of the family breadwinner?

Yes. Benefits are payable no matter how much savings or investment income you have. But there are limits on how much you can earn through employment.

Even if there is no survivor eligible for monthly payments, does Social Security pay on the death of every covered wage earner?

Yes. A lump sum for funeral reimbursement of up to $255 is payable to the spouse, or, if there is none, to whoever paid the funeral expense.

Is an elderly person with no other financial means entitled to social security?

No, social security must be earned through covered employment. Social security is often confused with the Federal-State old-age assistance program, which does aid elderly people in real need.

Can a self-employed person join the social security system or not as he chooses?

No. Social security coverage is mandatory for self-employed persons except in a few non-covered professions, such as medicine.

Speed is No Bargain! Tests made comparing a speed of 65 mph with one of 40 mph showed that gas consumption per mile at 65 increased 30 per cent, oil consumption even more. The number of brake applications and braking time increased 50 per cent. Tire wear is 2½ times as great. Is the few minutes saved worth the extra cost?

Can self-employed people who did not realize they should have been paying a social security tax

since 1954 get credit for those years?

Yes. Amended Federal income tax forms can be filed at the nearest Internal Revenue office to secure credit for three years back.

Are older folks who are still working eligible for benefits before they quit work?

Sometimes. A worker who reaches 72 can get payments even though he continues to work full time. Furthermore, an eligible beneficiary under 72 can collect at least some benefits. Even if he earns over $2,080 a year, he can get payments for any month in which he earns less than $80.

Must you count all income as "money earned" when claiming for social security payments?

No. Income from social security benefits, insurance annuities, company pensions, interest on bonds, dividends on stock, or in some instances the rent from your farm are not counted as "money earned."

This is by no means an attempt to clarify all aspects of social security as it relates to farmers. However, we do hope that it will arouse your interest to the point that you will want to know more about social security and how it relates to your particular situation. If you do desire additional information, address your inquiries to Social Security Administration. The address may be obtained at your post office.

Tranquilizers Help Animals

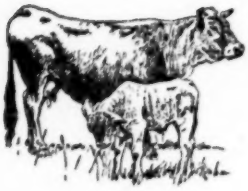
The tranquilizing drugs which are being used and discussed so much in the human field of medicine are now finding a useful place in treating animals, report researchers of the Ontario Veterinary College in Guelph, Canada. Among the many uses the drugs appear to have are the quieting of thoroughbred horses for training or other purposes, making dogs and cats easier to handle, and for making sows more at ease at farrowing time. There is even evidence to suggest that beef cattle gain faster, and dairy cows produce more when they are maintained on adequate levels of these new drugs.

According to the College, they have proved quite safe, even when tested with several doses per day over a period of time, much longer than most veterinarians would wish to use them.

Veterinary authorities agree that many more uses for the tranquilizing agents will become known in the near future.

—Ontario Government Services

Progress In Controlling Reproductive Cycle



Iowa researchers report new gains in solving this problem with cattle and hogs . . .

Condensed from National Hog Farmer

IOWA State College livestock research workers may be on the way to reducing or eliminating the problem of "repeat breeders" in cattle and swine herds—as well as controlling the reproductive cycle.

They reported at the annual meeting of the American Society of Animal Production that they had determined the levels of the hormone, progesterone, in the cow during pregnancy. Progesterone plays an important part in oestrous behavior of female animals, implantation of the early embryo and its survival, mammary fluid stimulation, and initiating the farrowing and calving mechanisms.

The Iowa State College workers are the first to achieve a successful analysis of the progesterone content of the various reproductive organs and fluids of a pregnant animal.

This opens the way to further work toward developing hormone supplementations that may enable animals with inadequate hormone levels to produce live offspring without breeding delays.

By knowing the estrogen-progesterone ratio found in animals whose embryos live to be born, it should be possible to provide the necessary amounts of estrogen and progesterone for many other animals which have been repeat breeders.

The timing of breeding is becoming more important economically. For swine producers it is a specially serious problem in connection with the multiple-farrowing, confinement rearing programs being adopted.

Studies on swine were reported to the society on the variations in the pituitary hormones, including the follicle-stimulating hormones, as related to the number of embryos implanted and the number of pigs farrowed.

Reprinted by permission from National Hog Farmer, Box 1561, Grundy Center, Iowa

Besides finding associations between these hormone levels and number of living embryos the Iowa research showed some significant breed differences. Landrace gilts, for instance, showed a higher level of follicle-stimulating hormone than Duroc gilts. This may be worth investigating further in connection with the fact that Landrace gilts normally produce larger litters than Durocs. This suggests that the Landrace may ovulate more eggs. Procedures that standardize the levels of the follicle-stimulating hormone may provide more uniform litter sizes.

Work was reported to find ways to synchronize the heat cycles in swine so that pig crops can be planned for chosen dates.

Milk consumption per person in the U. S. has declined considerably since World War II years when it reached more than 800 pounds. This year it will amount to about 700 lbs.

Swine producers speak of this as "group breeding."

Half of the experimental gilts given single injection of gonadotrophin at different stages of the heat cycle accepted the boar 18 to 23 days after the injection regardless of what part of the cycle they were in when treated. About 90 per cent of the eggs produced by these gilts became embryos.

It was pointed out that this means eggs produced by such an "induced" cycle can be fertilized and developed normally. This indicates that the reproductive cycle can be altered without affecting subsequent fertility.

Another study in this direction tests the possibility of controlling the cycle by modifying the activity of the pituitary gland, which controls ovarian function. This procedure permits the group all to come in heat about the same time. It's a matter of making some of the sows wait for others. It puts the reproductive cycle into low gear.

A mixture of progestin and estrogen temporarily suppresses the pituitary function so the gilts do not come in heat as long as the treatment is continued. They come in when the treatment is stopped.

Preliminary results indicate that gilts under treatment accept boars about 8 days after the treatment stops. These gilts, on the 25th day of pregnancy, showed a normal number of living embryos. This may point the way to a better method of group breeding than the use of the follicle-stimulating hormones acting directly on the ovary. In the preliminary trials, at least, it resulted in successful breeding of all the gilts instead of only half.

Besides, the progestin and estrogen treatment is expensive. It costs about 10 cents per animal for materials.

An experiment is in progress now using this same material in the gilt's ration. This would be simpler than injecting it, and probably as effective.

Other studies showed that injections of progesterone and estrogen hormones in the proper amount and ratio can keep embryos alive in spayed gilts.

The pregnant gilts were spayed in order to study the amount of estrogen and progestin produced by the ovary during pregnancy. Injected hormone replacements have resulted in live embryos thus far in the experiments—up to the 25th day of pregnancy. During early pregnancy pig embryos die immediately when the estrogen and progestin are not available.

Furthermore, this research at the Napier swine breeding farm showed that in a line of Poland China gilts characterized by a small number of surviving embryos, the embryonic mortality could be reduced significantly by administering estrogen and progestin during early pregnancy.

Potato Disease Identified As Soil-Borne Virus

A potato tuber disease known as corky ringspot has been identified by University of Wisconsin scientists as a soil-borne virus disease. It is a potential danger to potato growers everywhere.

The corky ringspot disease is the first soil-borne virus disease of potatoes found in the United States, although a related soil virus has for years plagued potato growers in Europe. In this country, it has been found definitely only in Florida, but Wisconsin plant pathologists are checking a similar type of internal browning of potato tubers found in Indiana and Washington to see if it is caused by the same virus.

Should the disease appear, seed potatoes from infected fields could not be certified. This possibility has spurred Wisconsin research, since plant diseases recognize no state boundaries.

Florida Sebago potatoes infected with the virus show marked brown, slightly sunken rings or line patterns, and shallow, irregular corky depressions, with brown dead tissue underneath these outside features.

A thorough knowledge of this soil-borne virus disease will help in developing control methods or resistant potato varieties, say the specialists. *—What's New In Farm Science*

Vitamin D For Feeder Lambs

A South Dakota study determines the benefits of vitamin D supplementing for feeder-lamb rations . . .

Condensed from
South Dakota Farm and Home Research
L. F. Bush, Associate Animal Husbandman

NATURE does not always supply farm animals with enough vitamin D. The vitamin D content of alfalfa hay varies greatly. Responses of animals to sunshine as a source of vitamin D also vary.

Usually, nature supplies enough vitamin D so that obvious signs of deficiencies, such as swollen joints, bent legs, and stiffness, are not noticed. However, there may still be enough of a deficiency to retard growth.

This study was started to see if supplementing feeder-lamb rations with vitamin D would be beneficial. Since vitamin D is closely related to calcium and phosphorus, the value of adding these minerals was also studied.

Results Vary

Performance of lambs varied between trials and treatments. Rations supplemented with vitamin D increased the growth rate in two of the three trials. The variation is probably due to differences in vitamin D content of alfalfa hay fed.

The trials were conducted at Newell and Brookings, South Dakota. They covered 3 years, 1955-58, and 576 western feeder lambs that averaged about 75 pounds were used.

The lambs were divided into four lots: (1) control; (2) one million U.S.P. units of vitamin D; (3) 500,000 U.S.P. units of vitamin D; and (4) mineral supplement. Each treatment was replicated.

The vitamin D was injected just under the skin at the beginning of the trials. In the first trial, the mineral was made up of two parts bone meal, and one part salt. It was fed free choice. In the last two trials, dicalcium phosphate was added to the protein supplement to make a calcium to phosphorus ratio of 1.75:1. Another treatment was also added in the last two trials. Lambs were fed irradiated yeast to supply vitamin D. The yeast was mixed in soybean meal to

Reprinted from South Dakota Farm and Home Research, Agricultural Experiment Station, South Dakota State College, Brookings, S. Dakota

furnish 2,000 U.S.P. units of vitamin D per lamb daily.

Lambs were hand-fed a ration of shelled corn and alfalfa hay, full-fed. Except for the first trial, they also received 0.1 pound of soybean oil meal. Salt was given free choice. All lambs were vaccinated against overeating disease at the start of the feeding period. Lamb weights were taken every 28 days.

500,000 Units Beneficial

All lots of lambs gained about the same, except the lot injected with 500,000 units of vitamin D. These lambs gained an average of 0.013 pound more a day, or 1 pound more per head during the 90-day feeding period.

"They that won't be counselled can't be helped."
—Benjamin Franklin

Lambs injected with 500,000 units were also more efficient. They required 31 pounds less feed per hundred pounds of gain than the controls, 22 pounds less than the lot injected with 1 million units, and 9.5 pounds less than the lot receiving minerals.

While the feeding of minerals did not increase growth rate, it did increase efficiency. Mineral-fed lambs required an average of 21.5 pounds less feed per hundred pounds of gain than the control lambs.

There was little difference in carcass quality among treatments.

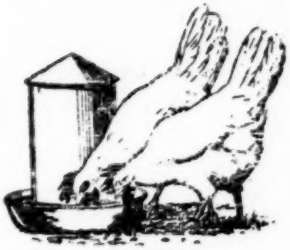
Feeding irradiated yeast to supply vitamin D seemed to lower palatability of the ration. Lambs ate slightly less feed per day; however, they gained a little faster than the controls. These lambs gained more efficiently than any of the other lots. They used 18.0 pounds less feed per hundred pounds of gain than the faster-gaining lambs that received 500,000 units vitamin D and 56 pounds less than the control lambs. Carcass grade and yield were not significantly affected by treatment.

Vitamin D Sometimes Needed

Since performance varied, it seems certain that some years the vitamin D content of alfalfa hay is high enough to keep lambs growing at a good rate. In other years, though, the vitamin D content of hay may be low enough so that you will be able to increase your lambs' rate of gain by supplying additional vitamin D.

A newspaper editor, with some space to fill, set up the Ten Commandments and ran them without editorial comment. The next day he got a letter from a subscriber saying: "Please cancel my subscription. You're getting too personal."

Crowding Birds Can Be Profitable



January birds laid at 70% in September . . .

Condensed from
New Jersey Farm and Garden

Bill Snyder

IF YOU have ever wondered just how much crowding of laying birds you could get away with, the experiments of a veteran poultryman might help you find the answer. Fred Stern, for nearly 30 years a well-known grower in New Jersey, is currently giving each laying bird two square feet of space—and without benefit of wire floors, slats, cages or the like. He is rearing 18,000 Leghorns in floor space formerly occupied by about 14,500 birds.

Many growers have attempted to squeeze more layers into the same space, giving them the benefit of increased production without the cost of new buildings, but those who have not used care have run into more trouble than they bargained for, according to a number of county agents questioned on the subject. Still, the desire to overcrowd has grown in recent months because of the long siege of near-marginal and submarginal prices.

"Any man who gives a layer less than 2½ square feet is running a risk," Stern admits, "and I've only gotten down to two square feet per bird by crowding a little more each year and by taking increased precautions as I went along."

Here is what the larger "capacity" has meant to Stern:

- He now has an 18,000-layer capacity, rather than a 14,500-layer maximum.
- He is using the same amount of labor to care for birds, although he is working longer to do it.
- Production has not suffered and his egg numbers are in proportion to his flock increase.
- Neither mortality nor cannibalism has increased.

How has the Stern farm adjusted to the rising layer capacity?

Most of his buildings went up before 1930 and the last ones were built by 1940, so almost all his pens are 20x20 feet. "We

Reprinted by permission from New Jersey Farm and Garden, Sea Isle City, New Jersey

are in the habit of placing 160 layers in a 20x20 pen in recent years, but last year I decided to give our Leghorns only 2¼ square feet of space. We put 180 birds in a pen. This year, I'm putting 200 in a pen," Stern notes.

To meet the rising number of birds, Stern kept feeders, waterers, nests and shell hoppers in proportion to the growing need. He uses four eight-foot feeders per pen (200 birds) and a nest for every five birds, keeps two wall hoppers for oyster shells per room and needs only one large float-valve-type watering unit per pen.

"Hot weather gives you the most problems," Stern says. "First of all, we whitewashed all of our asphalt roofs. Believe it or not, we brought the temperature down 4 to 10 degrees. Then we left doors and windows wide open.

"We added two five-gallon, galvanized watering pans to every pen, and we continue to cull very closely. At least once a month, we handle every bird on the farm. We do it in the daylight and with a catching hook because we find birds get used to us and get over their flightiness. We get rid of the weak birds and don't alloy a 'boarder' on the place. You've got to cull closely.

"Incidentally, the overcrowding helps with our breeder operation, too. Our breeders and our older birds are always a bit of an exception, and we are giving them 2½ square feet each. We cull rigidly, leaving only the very best birds, which become both the best layers on the farm and the best breeders. These breeders, as yearlings and older birds, go to work for Stern Brothers Hatchery."

Fred's brother, Gus, operates the hatchery, the two men operating separately.

"We have always used plastic goggles to prevent cannibalism, and it's probably more important to use them under these crowded conditions than before. We have no increased cannibalism or added mortality," reports Stern.

The leaves of house plants should be washed once a month to remove dust. A pinch of fertilizer can be added to two quarts of water for feeding the plants.

In the winter, of course, keeping the litter dry becomes more of a problem. Stern meets the problem by allowing as much ventilation as the weather will permit him, by more frequent removal of the litter around watering units and through stirring the litter more often. He finds that, in general, his litter is not badly affected by the increased capacity, although more care is necessary.

Happily, production has grown right along with his flock size, he finds. "For instance, my January birds were laying at 70% in September, and my Februarys were at 68% and still coming on. Although these birds do not move up to fantastic laying peaks—they are consistent layers at pretty high levels. They still don't drop below 60%, partially as a result of our culling."

What about the increased labor and egg room capacity to care for the larger flock? So far, Stern's employees and he have been able to care for egg gathering and management of pens with no noticeable increase in the work load.

"But we're all working longer in the egg room nights now, and it may get ahead of us and require more help before we are through," points out Stern.

Stern's final analysis of the new situation is pretty clear. The old recommendation of three square feet per bird is still the safest. But if you're going to crowd a little more, you've got to increase your precautions each step of the way.

Although many farmers have found trouble when they attempted to overcrowd, Stern points out that "it's more than worth the extra care when you watch that old egg check increase!"

Cockerel Teaser-Feeder Pays Dividends

A special cockerel feeder, hung high enough so that roosters can reach it but hens cannot, will pay dividends in better hatches, says Joe W. Sicer, Purdue University extension poultryman.

"Most roosters are gallant animals," Sicer explains. "When they find a choice morsel of food they call the hens and stand back while the "girls" get their fill. Too much of this and the males will not be able to maintain a satisfactory weight."

A different situation is created if a small hopper is hung on a post or on the laying house wall at such a height that only the tall male birds can eat out of it. Even a can will do the job, Sicer adds. The roosters will call the hens when they find the feed, but will eat the feed themselves when their calls bring no takers.

Sicer says the cockerel feeders should be kept filled with a complete ration. Both grain and mash should be offered. Better physical condition and better hatches usually result when "Dad" is given this special treatment. *—Indiana Extension*

Chemicals Aid Peach Thinning

Chemical thinning supplements regular practices to save labor, give bigger fruit . . .

Condensed from Ohio Farm and Home Research

Robert G. Hill, Jr.

PEACH thinning, the early removal of part of the crop of developing fruits, is essential to the production of large, high quality peaches. In most orchards, thinning requires more labor, with the exception of harvesting, than any other single operation.

Fruit thinning was a hand operation before World War II. Since then the shortage of labor has made it a most costly and sometimes difficult operation to perform. In an effort to reduce the thinning problem, a number of physical and chemical methods have been tested by the Ohio Agricultural Experiment Station.

For more than a decade, work has been in progress at Wooster to determine how a number of available chemical thinning compounds might be used to reduce the labor required for thinning. A number of compounds of both a caustic and hormone action have been tested. Among the materials tested were Dry Mix No. 1, Elgetol, napthalene acetic acid (NAA) napthylacetamide (NAM) and isoproply-n-(3-chlorophenyl) carbamate (Chloro IPC). Although during some seasons good results were obtained with these compounds, none of them proved entirely satisfactory for thinning peaches. Results were variable and trees or fruit were sometimes injured.

NPA Looks Good

A new thinning compound, NIP-A-THIN (NPA), was included in the 1956 studies. It was applied three days after full bloom at the rate of 200 ppm. It caused an early drop of developing peaches. No ill effects upon growth, yield or the bloom status of the trees the following year were noted. As a result of this successful experience, more detailed studies with NPA were initiated in 1957. Those studies showed that effective thinning resulted when sprays containing 250-300 parts per million were used, but that excess thinning resulted when 350 ppm was applied. Again, no injury from the

Reprinted from Ohio Farm and Home Research, Ohio Agricultural Experiment Station, Wooster, O.

use of NPA was noted.

Work with NPA was continued in 1958. In a replicated study, it was applied five days after full bloom at rates of 200, 250, 275, and 300 ppm to comparable Halehaven peach trees selected for uniformity of bloom. Included in each replicate was an unsprayed or check tree. Immediately after treatment test branches were selected on each of the 25 trees in the study and the number of flowers on those branches was determined. Three weeks after treatment the developing fruits on these branches were counted. Results showed that 82 per cent of the flowers on the unsprayed trees were developing into fruits while only

Sudden changes in a cow's daily routine may upset milk production.

56, 53, 37 and 36 per cent of the flowers on the trees which were sprayed with 200, 250, 275 and 300 ppm respectively were developing. When a similar count was made six weeks after treatment, it was found that 50.6 per cent of the unsprayed flowers were developing into fruit while for the 200, 250, 275 and 300 ppm trees, the per cent was 35, 37, 21.5 and 20 respectively. All treatments were found to have caused a significantly reduced number of developing fruits. The two treatments with the stronger concentrations had a greater thinning effect than the two of lower concentration.

Fruits Are Bigger

As soon as the fruits on the test branches of each tree were counted six weeks after treatment, each tree was thinned by hand to complete the job. One hundred of the fruits that were removed were selected at random and weighed. An average fruit from the check trees weighed 23 grams while those of the trees sprayed with 200, 250, 275 and 300 ppm weighed 28, 25, 31 and 32 grams, respectively. This increase in fruit size indicates the benefits of the early thinning obtained with NPA.

At harvest time the total number of pounds of peaches produced per tree was determined. There was no real difference in yield between the trees that received the different NPA treatments and the unsprayed trees. No injury to the trees was noted during the 1958 season.

The replicated studies with NPA have been limited to the variety Halehaven, because of the availability of trees of that variety. Limited work, however, has been done with other varieties at Wooster, Ohio, and at two other locations. This work suggests that NPA is generally

effective for all varieties.

Proper Amount Important

NPA is the best and most consistent chemical thinner for peaches so far tested. Its use is suggested to growers who wish to test it in their own orchards. Experimental results indicate that it should be applied three to five days after full bloom to mature bearing trees at rates of 250 to 275 ppm. When applying such sprays, growers should be careful to apply the proper gallonage, approximately that used when applying a pesticide spray. Overthinning may occur if too much spray is applied, while little or no thinning will result if too low a gallonage is used. A good idea for growers who use NPA is to leave a few unsprayed trees so that they may have a gauge of the value of the thinning spray. The general use of NPA for peach thinning, however, cannot be recommended until its performance under growing conditions throughout the state can be determined.

Chemical thinning with NPA is not suggested as a replacement for, but as a supplement to, the regular physical thinning practices. When used properly, it should offer the grower the benefits of both early thinning and a reduced demand for thinning labor. Because an early application is necessary for effective thinning, it is not recommended for use in orchards where frost is an annual hazard.

For Cattle Grub Control Use Rotenone

Although new systemic materials have been developed and are being demonstrated on beef animals to control cattle grubs, rotenone is still the Number 1 recommended treatment in South Carolina, according to W. C. Nettles, leader of Clemson College Extension Entomology and Plant Disease Work.

He points out that rotenone should be applied when grubs first appear in the backs of animals and at monthly intervals thereafter. For South Carolina cattle growers, this will mean about three applications each year beginning around Christmastime and at monthly intervals thereafter.

"Rotenone may be applied in either spray or dust form," Nettles says. "For a spray, use 7½ pounds of 5 per cent rotenone powder per 100 gallons water. In applying, 400 pounds pressure is desirable. A 1.5 to 5 per cent dust may be applied to backs of infested animals, but first remove scabs with a stiff brush before treating."

—Clemson Agricultural College

Can You Pay For Rebuilding A Run-Down Farm?

High-producing herds and good prices are needed to finance major soil improvements . . .

Condensed from
What's New In Crops & Soils

R. H. Blosser, Agricultural Economist,
Ohio State University

MANY farmers know what to do to build up the productivity of a run-down farm. But how many can farm well enough to pay for the improvement out of its own earnings.

A study in Ohio shows that top grade livestock management and good farm prices are needed if farm earnings are to finance a major soil improvement program if you pay for labor and capital at prevailing rates.

On the dairy farm studied, neither terracing nor contour strip cropping had ever been used in the control of erosion. Over half of the original top soil was gone. Less than 100 pounds per acre of single-strength fertilizer was used on corn, oats, and wheat. Meadows and permanent pasture had received no fertilizer. Although the soil was strongly acid in reaction, lime had never been applied.

Annual receipts, expenses and net income resulting from the soil improvement program were calculated so that everything was kept the same, except the changes under study. Actual income figures are seldom satisfactory for a study of this type because farmers usually adopt other income-increasing practices along with the establishment of better land management. Under these conditions, changes in income do not accurately measure the gains of a soil improvement program alone.

All calculations were made for three complete crop rotations or a 13-year period. Annual crop production was calculated from the following acreages: Corn 12, wheat 14, meadow 34, permanent pasture 36, woods and miscellaneous 24.

Corn yields were figured at 50 bushels per acre in the first year

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of the program and 65 bushels in the thirteenth year. Wheat yields were increased from 22 to 26 bushels. Hay yields were 1.0 tons of timothy for the first year and 2.8 tons of alfalfa clover, and timothy for the thirteenth.

Corn yields were based on using 350 pounds of single strength fertilizer per acre. For wheat

An old-timer is a man who remembers when the only problem about parking was to get the girl to agree to it.

the rate was 450 pounds. Hay yield was based on top-dressing the first year meadows with 200 pounds per acre after making the first cutting. Also, the cropland would have to receive 4 tons of agricultural ground limestone per acre, or its equivalent, as an initial application. Maintenance applications would amount to 1 ton per acre every 4 years. In addition, contour strip cropping would be needed to control erosion.

Permanent pasture yields under the soil improvement program were based on 3 tons of agricultural ground limestone per acre for the initial application followed by 1 ton every 4 years; and 600 pounds of single strength fertilizer every 3 years.

Feed produced in the thirteenth year of the program would support about twice the number of dairy cows kept before any soil improvements were made.

The average farmer in southeast Ohio where this study was made, producing 7,000 pounds of milk per cow selling at $3.00 net per hundred pounds on the grade B market, will need more than 40 years to pay all costs of the soil improvement program. This is based on financing the entire program out of farm earnings using 1950-54 farm prices and production costs. It includes a payment to all labor of 75 cents an hour plus the use of a house, and a 4% interest charge on all capital invested.

To pay for the program in 20 years with manufactured milk prices ($3.00 net per hundredweight in Ohio from 1950-54) will require cows averaging about 8,400 pounds of milk. To pay for the program in 10 years with $3.00 milk, would require cows averaging about 11,000 pounds.

With top producing cows (10,000 pounds of milk) and grade A milk prices $4.00 per hundred pounds after deducting hauling charges only 4 years will be needed for farm earnings to finance the soil building program. But with average cows and grade A milk prices (7,000 pounds of milk at $4.00 per hundredweight) about 10 years would be required.

Other calculations show that if $2,500 is used annually for fam-

ily living expenses, farm earnings will not be sufficient for the average farmer (7,000 pounds of milk per cow at $3.00 net per hundredweight) to make any payments of interest or principal before the ninth year of the program. But with top producing cows (10,000 pounds of milk) and grade A milk prices ($4.00 net per hundredweight) payments of interest and principal can be made after the third year.

Most farmers can finance a minor soil improvement program out of current farm earnings. But a major program will have to be financed over a period of time. This may often be difficult for the average farmer who just about breaks even on a good farm.

How then might an average farmer finance a big soil improvement program? He might use his own capital on which no cash outlay for interest has to be made. He might use some off-farm income during the early years of the program. At that time labor requirements would be about 1,000 hours less than needed in the 13th year. Also, he might reduce the level of family living to only the bare necessities for a few years.

Plants Feed Through Roots

Roots are very important to the plant since through them practically all mineral nutrients and water enter. Roots are actually the first part of the plant to suffer when a deficiency of nutrients occurs. Intensive and extensive root growth results in —

1. More complete utilization of nutrients in the fertilizer application zone.

2. More extensive feeding for nutrients. This may be particularly important with minor elements, because the roots may penetrate to an area where pH conditions are more favorable for minor element availability. The more lines there are in the lake, the greater opportunity of catching more fish.

3. Larger reservoir of water from which to draw. The deeper penetration of the roots simply means that the plant has larger reserve supply in case of a drouth.

4. Plant is better anchored. Some corn lodging and much crop heaving over winter is related to a low supply of nutrients.

—Potash Newsletter For The Midwest

The Steer of Tomorrow

Here's a crystal ball preview of the type of cattle U. S. farmers will be producing by the year 2000 . . .

Condensed from National Livestock Producer

Stuart H. Fowler, Louisiana State University

THE steer of tomorrow may be a large, lean, muscular beef factory of fatless finish and nondescript conformation, a gutless wonder with a built-in super-efficient feed conversion unit.

Our crystal ball gives a cloudy preview of this "steak maker" of the future, but recent advances in cattle breeding, nutrition, research and management and knowledge of meat technology, merchandising and consumer preferences provide a fairly solid foundation for an educated guess as to the kind of steer that stockmen will vote "most likely to succeed."

Any predictions will be open to controversy, but most cattlemen will agree that we must start retooling the production of our breeding and commercial herds so that complete conversion will be made in time to assure cattlemen of continued fair profits for the fruits of their labor.

Anyway, as food (or steers) for thought, let's move ahead with a critical analysis of our beef-making machine of tomorrow.

First consideration might well be size, or specifically, weight-for-age. Since slaughter animals are sold by the pound, weight-for-age is of tremendous importance to the producer. There has been considerable emphasis on this factor in recent years, especially since the upsurge in performance testing.

As for size alone, the Steer of Tomorrow won't be as big as Paul Bunyan's blue ox, Babe, as some producers fear might be the end result of production testing. At the same time, the steer will probably never again approach the compact and compressed "point of diminishing return" of yesteryear that heralded the approach of the dwarfism era.

Size, of course, is important, but there will be little demand for a bulky, coarse beast. The animal must possess a real advantage in weight-for-age. This means that our Steer of the

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Future should weigh not less than 475 pounds as a weanling calf at seven months of age—and he should weigh close to 1,000 pounds if marketed at 16 months of age. On this basis, our steer should be able to produce 1.3 pounds of chilled carcass beef per day of age.

It is important, however, that our Steer of Tomorrow (let's call him Steer 2000 A.D.) remains versatile enough that he can be marketed at any age after weaning. Steer A.D. (for Active Doer) must possess the ability to grow rapidly, yet mature sufficiently early to put on enough finish to satisfy consumer demand.

Research indicates that steers making the more rapid gains consume less feed per 100 pounds gain and generally have higher carcass grades. Of additional importance, rapid gains result in a higher proportion of lean meat in the rib-eye muscle. If A.D. is a rapid gainer, he will retain a high proportion of protein for conversion into red lean meat. In contrast, slow-gaining calves tend to build body fat at an earlier age.

Rapid Gains Are Important

Fast-growing breeding stock produce rapid gaining calves, because ability to make rapid gains is highly heritable. Thus, rapid-gaining A.D. will be out of a big, roomy cow that has a high production index, and his sire will be a performance-tested bull that has demonstrated his ability to make rapid, economical gains.

The recent round of consumer surveys aimed at checking beef grade preference indicate that our Steer of Tomorrow will be a lean, muscular beef producer. There is some doubt as to whether preferences have moved as far toward leanness as the surveys indicate. However, there is little doubt that we must develop lines or families of cattle that will consistently convert a large portion of their feed into lean muscle and less into fat.

The progressive cattleman, in looking to the future, knows he has to collect and maintain a reservoir of germ plasma that will permit shifts in type of cattle used so as to be in step with the consumer demand and to insure the production of a saleable product. Considerable current research is aimed at developing means of measuring leanness in live cattle. The establishment of such workable methods would greatly accelerate progress in the direction of meat-type lines of cattle.

Considering the size of it, it's easy to understand why they call the federal budget "unbalanced." It's just crazy.

Red meat, or muscle, development must be bred into our cattle. The size of the muscles is determined to greatest extent by the number of individual muscle fibers that go into building the muscles. When A. D. gets his start as a fertilized egg in his mother's oviduct, his muscle-fiber number is fixed, and no feeding or management program can add to it. Thus, bulls and cows with a wealth of natural fleshing are of paramount importance. Such breeding stock is the only kind that we can reasonably expect to transmit deep, thick natural fleshing to our Steer of Tomorrow.

In selecting thickly fleshed parents for A.D., we need a point on the live animal where we can determine the size of the muscles without interference from deposits of fat. Recalling my experience as a packer buyer, I would suggest the muscle on the upper, front portion of the forearm as the most reliable point for checking natural fleshing. If you can grasp a large, full muscle in your hand at that point, you can depend on full body. Of additional help in identifying well-muscled breeding stock is the fact that increased body length and greater length of upper hind legs are both associated with a larger rib-eye muscle.

Some of the world's most disappointed people are those who get what is coming to them.

The area of the rib eye is our best single standard of overall carcass muscling. There is a correlation of approximately 0.85 between the area of the eye muscle at the twelfth rib and the percentage of red meat in the entire carcass. This is a rather high association, because a perfect relationship would be expressed by a correlation of 1.0. Approximately three-fourths of the differences in rib-eye area in cattle is due to hereditary factors. Thus, considerable progress can be made toward increasing lean meat development in a herd by collecting rib-eye data on steers marketed and making full breeding use of sires and dams and near relatives of those individuals cutting the largest rib-eyes.

Our Steer of Tomorrow should produce a carcass that possesses a minimum of two square inches of rib-eye area for each hundred weight of carcass. Thus, a 500-pound carcass would have a rib eye measuring at least 10 square inches, and a 700-pound carcass should exhibit a 14-square-inch rib eye.

Steer 2000 A.D. will not be fatless. However, his carcass will look more like the "after" than the "before" specimen in the ad promoting the latest weight-re-

ducing elixir. If A.D. goes to market as a thousand-pounder, his carcass will hold a trimmable fat content of 6% or less, and there will be less than a half inch of fat on any surface.

The revision of federal grades for beef carcasses in recent years reflected the increasing demand by consumers for leaner cuts of meat. It is quite likely that the next few years will see further revisions in grade standards for beef. With the use of modern live stock breeding and feeding programs and with the adoption of newer concepts on meat processing and cookery, it is apparent that consumers can have tender and flavorful meat without fattening animals to the point formerly considered necessary.

Tenderness Is Inherited

For many years, the belief has prevailed that tenderness of beef increases with fatness. However, this relationship apparently is not as direct as was formerly thought. Newer research tells us that greater tenderness is not necessarily obtained from carcasses having the highest percentage of fat, although there is a slight trend toward greater tenderness with a higher degree of marbling.

Fortunately, recent research shows that total fatness and marbling don't have to travel together. Steers with less fat sometimes exhibit more extensive marbling than more heavily finished animals. Thus, it appears that adequate marbling may be selected directly and maintained without excess fat. Other research indicates that tenderness may be inherited; one study yielded a heritability of about 41%. This would indicate that direct selection can be practiced for tenderness with reasonable expectation of considerable progress. However, with the extensive research in progress on tenderizers and the probability that they will come into widespread use in the years ahead, A.D. probably will not be bred primarily for tenderness.

A good leader inspires other men with confidence in him; a great leader inspires them with confidence in themselves.

Conformation as a grade factor has been under considerable debate the past year or two. Some groups want conformation discarded. Does this make you shudder for fear that A.D. will be a rangy, leggy, shallowbodied jug-head that you will want to keep out of sight on the "back forty"?

Well, he will probably have more length of body and perhaps a bit longer length of leg than the commonly accepted ideal of today, because these characteristics appear to be associated with

greater rib-eye area. However, I don't believe A.D. will become a fugitive from a freak show (even though recent studies have revealed that the producer has considerable freedom in selecting animals of different shapes without encountering large changes in the proportion of wholesale cuts).

Buyers Look for Width

Packer buyers will continue to look for great width along the top and deep, bulging hind quarters when they ride into pens of fat steers. This will be true even though carcass shape may become less important if the trend

"A man has to live with himself, and he should see to it that he always has good company." —Charles Evens Hughes

toward closely trimmed, boneless retail cuts continues. Practically everyone prefers steaks and roasts (with the exception of teenagers who demand hamburger!). Width over the top and fullness in the quarters are important—the cuts in greatest demand are located in these regions.

An imaginary line reaching from the top of A.D.'s shoulders and down along the side of his hocks would separate the higher-priced cuts above the line from the lower-priced cuts below the line. Consequently, greater development above the imaginary value line would increase A.D.'s yield in the preferred cuts. Such development would include well fleshed crops; full spring of ribs; broad, thick loin; long, wide, level rump; and full, deep rounds. A.D. should produce a carcass which will yield in excess of 48% in the preferred cuts (loin, rib, and round).

A.D. will not be a gutless wonder, although such a condition would reduce shrinkage and increase dressing yield. Our Steer of Tomorrow will be a beef factory—as such, he must have capacity to process liberal supplies of raw material (feed) into the finished product (beef). He must have capacity to consume sufficient levels of feed above his maintenance needs so as to provide productive energy for the most rapid and economical gains.

A.D. will be an efficient converter of grain and roughage into steaks, roasts and hamburger. This will be essential if cattlemen are to keep beef competitive with other meats and meat substitutes in the years ahead. On the TDN (total digestible nutrient) basis, beef cattle are by far the least efficient of domestic live stock in converting feed into human food. The young calf may be fairly equivalent to the chick or pig in efficiency, but his efficiency drops off rapidly as he becomes older.

Probably the major emphasis in A.D.'s development should be placed on a combination of rate and economy of gain. This is suggested because of the probable widespread use of tenderizers in the future, consumer preference for meat without excess fat, and further developments in merchandising of prepackaged meats.

As a yearling, A.D. should be able to make 100 pounds of gain on less than 800 pounds of feed, of which about one-third will be roughage and two-thirds concentrate.

The marked improvement in feed efficiency which has been accomplished with swine has been secured through a combination of three procedures: (1) obtaining faster gains through selective breeding and improved rations; (2) slaughtering at lighter weights, and, (3) producing meat-type animals with less fat. The first and third of these procedures hold real promise for greatly improving A.D.'s efficiency.

Performance testing work has demonstrated that it is possible to select and produce cattle that make more efficient gains. There is a rather high relationship between rate of gain and pounds of liveweight increase per unit of feed consumed. In other words, if A.D.'s sire and dam are selected for outstanding weight-for-age or average daily gain, they will most likely be highly efficient converters of feed into beef. And, since efficiency of feed utilization has a reasonably high heritability, they will transmit much of their efficiency of gains to the Steer of Tomorrow.

Breed for Faster Gains

About 60 to 80% of the differences in feed consumed per unit of liveweight increase in cattle is accounted for by rate of gain. Thus, considerable improvement in efficiency can be accomplished by selecting breeding stock from the most rapid-gaining cattle. In other words, we would be breeding entirely indirectly for efficiency of gains through breeding for faster gaining cattle.

"A man's worst enemy is his own disinclination to do the things he knows he should!"

However, there remains about 20 to 40% of the variation in efficiency which can't be accounted for by rate of gain. This may be due to such factors as differences in the ability of cattle to digest feed. Thus, with the increased stress on the importance of efficiency of gains, it may pay in laying plans for Steer 2000 A.D. to test his ancestors not only for rate of gain but directly for efficiency of gain as well. This will mean keeping

additional records, but it may prove to be a real paying proposition.

To me, these are the essential ingredients that will result in the money-making Steer of Tomorrow. Our crystal-ball concept may have a few fuzzy spots at present, but most signs indicate that the Steer of Tomorrow won't be a "Bovine Ugly Duckling." Efficiency will be of paramount importance and should receive considerable attention in planning your cattle production program. Do you have a suitable bull and cow on your spread to produce Steer 2000 A.D.?

Antibiotic Increases Swine Production

Results of a three-year study at the University of Georgia Experiment Station showed that feeding the antibiotic, chlortetracycline, to sows continuously through the gestation-lactation cycle for three generations resulted in an increase in the percentage of live pigs born. The average number of live pigs farrowed per litter was 8.00 and 8.63 for the non-treated and treated groups respectively. Significant treatment differences were also found to exist in the percentage of pigs weaned. Sows fed the antibiotic also weaned a significantly higher percentage of the pigs farrowed alive than did the untreated sows. Data were obtained on a total of 121 litters involving 1,120 pigs farrowed with three generations represented. The antibiotic was fed at a level of five grams per ton of complete sow feed. —*AG-Research*

Hog Cholera May Be Carried by Lung Worms — Recent studies which indicate that swine lung-worms may be carriers for the cause of hog cholera mean the disease could "overwinter" in soil where cholera-infected hogs were kept the summer before. This could also explain why some farmers have had cholera outbreaks when the only apparent source was an earlier infection on the place. In the past, it has been thought that cholera spreads only by direct contact or on clothes, equipment or vehicles. —*Feedstuffs*

Oil Helps Solve Bloat Problem

Reduce cattle bloat by use of crude soybean oil or lard oil. Here are results of experimental work at the Iowa Experiment Station . . .

Condensed from
Iowa Farm Science

BLOAT, one of the cattle industry's most destructive and unpredictable nutritional diseases, can be appreciably reduced by feeding either crude soybean oil or lard oil. So far, these have been the most promising preventatives tried during the Iowa Experiment Station's longtime inquiry into the causes and control of bloat.

One method which proved relatively effective called for feeding grain mixed with ¼ pound of either soybean oil or lard oil per animal immediately before grazing. Though the preventative effect was very marked for 3 to 4 hours after treatment, it rapidly declined thereafter. Animals fed the oil gained weight more rapidly (0.6-0.7 pounds more per animal daily) than did those fed grain only.

For animals consuming alfalfa silage, effective bloat control came from sprinkling crude soybean oil over the silage at the rate of ¼ pound per 1,000 pounds of body weight daily. In other tests N-decyl alcohol reduced bloat, but for too short a duration to be of practical use.

Penicillin (75 mg. per animal daily) reduced bloat for about 9 days, but then the effect disappeared. Raising the level to 125 mg. again reduced bloat, but the effect lasted only for 2 days.

For treatment of bloated animals, placing 150-200 ml. of lard oil into the rumen by stomach tube provided prompt relief.

While promising, these results are still preliminary. More field trials are planned on bloat-producing alfalfa pastures to test the effectiveness of oils and possibly other substances in curbing bloat.

Other avenues are being used

Reprinted from Iowa Farm Science, Iowa State College, Ames, Iowa

to explore bloat further. One is the use of radioactive iodinated soybean oil to study fat metabolism in the rumen. Another is to chemically analyze alfalfa to determine relationships between plant composition and bloat. The effects of weather, irrigation and other factors are also being studied.

New "Zig-Zag" Fence

A "quick-up and quick-down" woven wire fence — just the thing for temporarily confining pigs, lambs, calves or chickens — has proven itself after 8 years of tests at the University of Minnesota Rosemount station.

This fence is non-electric and is built in a "zig-zag" pattern. As far as construction is concerned, it's the last word in ease and simplicity. It requires no fence stretcher, no special tools other than a hand-type post driver, and only two diagonal braces, one on either end.

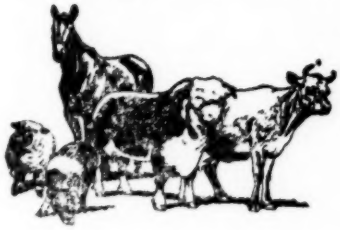
The slack in the wire is taken up by line posts, each of which lean sideways in the direction opposite to the preceding and succeeding posts. This gives the fence its zig-zag" appearance.

Here's how to build it: Roll out the necessary amount of wire between two sunken wooden posts, one at each end of the stretch being fenced in. Attach a "two-by-six" piece of lumber to each end of the woven wire and tie this member to an end post with galvanized wire. Then, starting at one end, drive steel posts at an angle against the woven wire, putting each one on the opposite side of the wire and leaning it in the opposite direction of the one before. Each post helps tighten the wire, until when you drive the last one, all the slack should be taken up. Steel posts with small "humps" on the wire side are recommended to keep the wire from moving up or down. Space the posts about 15 feet apart.

It shouldn't take two men more than 30 minutes to roll out the wire, tie the ends and drive line posts for a 20-rod stretch of zig-zag fence. And when the fence is taken down, you can leave the two-by-sixes attached, roll up the wire, and use for another zig-zag enclosure later on.

—University Farm and Home News

Changes in Packers & Stockyards Act



If you market livestock, changes in this Federal law will mean changes for you.

Condensed from

Agricultural Marketing

Glenn G. Bierman

ARE you a livestock or poultry producer—are you a consumer—or are you performing any of the marketing, slaughtering, processing, or merchandising jobs in between?

Whichever of these categories you fit, you undoubtedly will benefit from the broader protection now provided by the Packers and Stockyards Act. If you perform one of the "in-between" jobs and are involved in interstate commerce, you probably are subject to the regulations of the Act. A recent amendment to this law extends its provisions to almost all persons dealing with interstate marketing of livestock.

The Act, in essence a code of ethics for the industry, sets out rules of fair business practice which provide protection for the farmer and consumer as well as for the livestock and poultry marketing and meat packing industries. The new amendment makes this protection more far-reaching than ever before.

Formerly only livestock markets doing interstate business and covering 20,000 or more square feet came under the jurisdiction of the Act. Also, only transactions at "posted" livestock markets were subject to regulation.

Now markets of all sizes come under the law and any dealer or agency handling livestock (interstate) must observe these rules of fair and honest business practice.

The new amendment to the P & S Act, in fact, eventually could provide all farmers who sell their livestock at any market or to any dealer or agency engaged in interstate commerce with the same protection that they now obtain at the larger markets.

The amendment also divides jurisdiction over packers and chain stores engaged in meat packing operations between USDA and the Federal Trade Commission.

Reprinted from Agricultural Marketing, Agricultural Marketing Service, U.S.D.A., Washington 25, D. C.

The effect of this division is to give FTC the jurisdiction, formerly exercised by the Department, over retail sales and over the manufacture and merchandising by packers of non-meat items such as oleomargarine, ice cream, and leather and sporting goods. Responsibility for all other operations of meat packers remains with USDA.

The Department, in particular the Packers Stockyards Branch, Livestock Division, Agricultural Marketing Service, which is charged with carrying out the provisions of the law, retains its traditional role in:

1. Safeguarding farmers and ranchers from marketing practices which would deprive them of the true market value of their livestock and poultry;

2. Protecting consumers against unfair business practices in the marketing of meats and poultry; and

3. Protecting members of the livestock and poultry marketing and meat industries from unfair, deceptive, unjustly discriminatory, or monopolistic practices of competitors, large or small.

To see how the Act protects the packer and the consumer from unfair competition, let's take the case of a packer who believes he is losing his market for his product because a competitor is selling a similar product in his market area at less than cost in order to drive him out of business.

Let's say that the other firm can do this because it sells a more diversified line and can absorb losses on this product with profits on other items or on sales in other areas. The first packer, although as efficient as his competitor, cannot long meet this unfair competition since he must sell his product at a profit in order to continue in operation.

What can he do about it? He can notify the Department that this unfair practice exists and provide information on the situation. The Department can then investigate to see whether or not the other firm is competing unfairly or discriminating unjustly against him. If an unlawful practice is uncovered, the Department can compel its discontinuance.

"We have committed the golden rule to memory; let us now commit it to life."
—Edwin Markham

In many instances the P & S Act may provide the only available protection against such "unfair and discriminatory practices."

This is protection for the consumer as well as the packer. Though the consumer may benefit from lower prices while one firm is selling below cost, he may

later be faced with higher prices than existed formerly if one firm gains control of the local market.

The P & S Act provides protection against dishonest and unscrupulous practices. Representatives of the P & S Branch are especially anxious to prevent unfair competition through misrepresentation of the quality, manufacture, or value of a product. Such practices deceive the consumer and can drive the honest firm out of business.

At present, the Department is studying methods of eliminating misrepresentation of the quality of meat through misuse of the Federal grade terms specified in U. S. standards for meat.

There are men who will do anything for money — except work.

Just recently a packer complained that one of his competitors was misrepresenting the quality of his beef by rolling carcasses with his own "Good" stamp. When these carcasses were checked by a Federal grader, not one measured up to the U. S. standards for the USDA Good grade. They ranged instead from the USDA Standard grade down through USDA Cutter and Canner.

Obviously such inferior carcasses could be sold more cheaply than true USDA Good beef and the consumer, relying on the grade term used, could be deceived by the false quality representation. Left unchecked, this practice could destroy fair competition and undermine the usefulness of the Federal meat grades—both for the honest packer and retailer and for the consumers who depend upon them as unvarying and reliable indications of quality.

The P & S Act is designed to provide farmers and ranchers with five-way marketing protection by requiring:

- *Accurate weights.* Posted markets, and now all buying stations, dealers, and marketing agencies (in interstate commerce) will be obligated under the law to have accurate scales.
- *Protection of their funds.* The law contains authority to require all marketing agencies and dealers (subject to the Act) to be bonded to cover their obligations for livestock. As each of these is registered with the Department, bond coverage will be required.
- *Full and accurate accounting.* All persons buying, selling, or handling livestock in commerce are required to provide the farmer or rancher with a full and accurate accounting of all facts connected with the sale of his livestock.

● *Reasonable and adequate facilities at fair and nondescriminatory rates.* Required under the law at all posted markets.

● *Sale of livestock under open competitive conditions.* The Act prohibits any unfair, deceptive, unjustly discriminatory, or monopolistic practices which would prevent the farmer from receiving full value for his livestock.

How do the USDA marketing specialists carry out all of these provisions of the Packers and Stockyards Act?

Regular supervisory trips to livestock markets and packing plants provide the primary means of keeping informed of what is going on. In addition, any individual may make a complaint if he feels that he has been treated unfairly by anyone subject to the Act. Such complaints are investigated without cost to the complainant.

If the livestock seller believes some action of a stockyard company, a marketing agency or dealer subject to the Act has caused him loss or damage in marketing his livestock, he may also file a petition for reparations. After investigation and hearing in the Department, an award may be made if his claim is justified.

The basic penalty available to the P & S Branch, when violations are found, is the cease and desist order. Issuance of this order means that the violator must discontinue the practice in question.

More serious violations by market agency and dealer registrants may bring about a suspension of the violator's P & S registration—which, in effect, bars him from doing business for the period of the suspension.

Violations of criminal law, such as false weighing and accounting, when uncovered by P & S investigators, are turned over to the Department of Justice for prosecution.

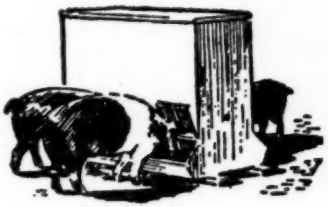
The Department of Agriculture has wide authority under the terms of the Packers and Stockyards Act, and the USDA employees charged with carrying out its provisions make every attempt to see that the law is applied impartially and thus fulfills its purpose: To assure fair competition and fair trade practices in livestock marketing and in the meat packing industry.

Two married men were discussing their joys and sorrows.

First—My wife is very poetic. She gets up at sunrise, wakens me and says, "Lo, the Morn."

Second—Huh! My wife wakens me and says, "Mow the lawn."

Good Pork — But Cheap



A summary of traits that are of primary importance in the efficient production of quality pork . . .

Condensed from Breeder's Gazette

J. A. Whatley, Jr.,
Oklahoma State University

IN THE efficient production of quality pork, 3 traits are of primary importance: sow productivity, efficiency of gain, and carcass merit.

Sow productivity, as expressed by litter size and litter weaning weight, is of major economic importance, but a trait difficult for you to improve by selection. The genetic nature of this trait is such that it responds more quickly to improved feeding management than it does to selection.

The heritability of sow productivity is low. Only 5% to 10% of the differences in single litter production by different sows seems to be heritable. Selection of sows on the basis of one litter record or selecting pigs based on the size of the litter in which they are raised produces rather slow improvement. Selection effectiveness can be improved by selection on the sow's lifetime production and by her sib's production, but even then progress is slow. (In genetics, a sib is a brother or sister, irrespective of sex; offspring of the same parents, litter mates.) In contrast to the low heritability of this trait and the difficulty of improving it by selection is the relatively high degree of hybrid vigor in litter size in a crossing program. In experiments at Oklahoma, the productivity of linecross sows has averaged 12% higher than that of conventional purebred sows in the same herd.

How Much Did She Weigh At 6 Months?

Efficiency of gain has a heritability of 25% to 30%, which makes it roughly 3 to 5 times as heritable as sow productivity. We could expect good response to selection for efficient gains, provided that individual performance could be economically measured. Individual feeding tests to measure feed efficiency are rather expensive and time consuming. Furthermore, the feed wastage in many feeding tests greatly reduces the accuracy of selection.

Reprinted by permission from Breeder's Gazette, Columbia, Missouri

Selection for rate of gain or weight for age (154 or 180-day weight) as indirect selection for efficiency of gain is probably the best practical method to use in selecting gilts. This is possible because of the relationship between rate and efficiency of gain. The faster gaining hogs tend to be the more efficient gainers. This relationship is not extremely high, however, and the increased accuracy of selecting for feed efficiency directly makes it well worth a seedstock breeder's time to use feeding tests for evaluating boars. If individual boar feeding tests are not practical, then feed records on pens of litter-mate boars by the same sire should be used.

Don't kill hogs and process the meat on the farm if average temperatures are above 40 degrees.

Loin-Eye Highly Heritable

Heterosis or hybrid vigor in rate of gain is expressed in a crossing program, but the degree seems to be roughly half as great as that shown for sow productivity. In our tests the linecross hogs have gained about 6% faster on 3% less feed than conventional stock.

Traits indicating carcass merit seem to be among the more highly hereditary traits in hogs. The heritability of carcass length is about 60%. Backfat thickness and size of loin eye are about 40% to 50% heritable. These high heritabilities indicate that selection for more desirable carcasses is in the evaluation of breeding stock for carcass merit. Naturally, we can not appraise them directly. We can evaluate the prospective breeding animal either by live animal appraisal or by carcass data obtained on its litter mates, half-sibs or offspring. A combination of live animal appraisal and carcass data on relatives would be more accurate than either appraisal by itself.

The best live animal appraisal is obtained by a combination of probe backfat measurement at a standard weight and judgment for muscling and length. The best single measure of carcass value on the live animal that we have found is the probe backfat thickness.

In experiments we have found little or no evidence of hybrid vigor in carcass merit. The carcass merit of cross pigs has been about average of the merit of the lines or breeds crossed. We have observed no extra boost in carcass merit from crossbreeding itself.

The Rotation Cross

From the available information it seems that some sort of systematic crossing program is advantageous for the market hog producer. This might take the form

of crossing specialized lines developed specifically for cross-breeding or the crossing of breeds chosen for their ability to complement each other in economically important traits. A rotation crossing program, using boars from three or four lines or breeds on successive generation of sows produced within a herd, seems to be the most practical procedure to use. Such a program permits us to utilize the hybrid vigor in productivity of cross sows and the faster gains of cross pigs. The crossing program itself will not necessarily improve carcass merit. Good Meat-type lines or breeds must be used to produce desirable Meat-type cross pigs.

The seedstock or purebred breeder has the job of producing good performing Meat-type boars for such a program. The purebred breeder must exert every effort to improve the performance of his stock in the traits mentioned. In order to do this effectively he must rely more on records in performance testing than has previously been done. Many are doing this in Meat-type certification and other performance programs sponsored by breed associations.

Anemia Prevention in Pigs

Two iron dextran shots plus fresh soil daily helps baby pigs grow rapidly and build up resistance to anemia, Purdue University animal scientists have found.

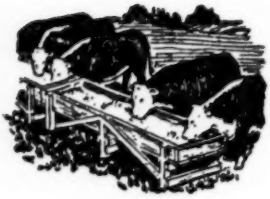
J. H. Conrad, Purdue swine nutritionist, reporting on anemia research, says that the heaviest pigs at six weeks and the highest hemoglobin levels at five weeks were obtained from a combination of iron dextran shots and fresh soil daily.

The pigs received a two cc. shot of iron dextran solution when they were three days old. A second shot of one cc. was given at three weeks of age plus fresh soil daily.

One iron injection plus soil resulted in heavier pigs and higher hemoglobin levels than two injections, one injection or soil alone.

"The hemoglobin level essential for maximum growth and disease resistance in the young pig is not known; but in the study, pigs with the highest hemoglobin level at five weeks were also the heaviest pigs at six weeks," Conrad said. —*Purdue University*

Cattlemen See Research



Latest research on beef cattle is rounded-up in this article about a Michigan State University Cattle Feeders Day . . .

Condensed from Michigan Farmer

A RECENT Cattle Feeders Day at Michigan State University again gave beef researchers a chance to tell about their work.

In one project, Texas steers were put on feeding tests in May at MSU, reported George Branaman, MSU animal husbandryman.

Three lots of steers that got corn and forage in summer and fall were finished in 202 days. Three other lots got forage in summer and fall, but got no corn in summer; they took 271 days to reach finish.

Lowest cost per pound of gain was 12.4 cents in the lot getting corn while on pasture. Fresh chopped roughage instead of pasture brought the cost up to 14.6 cents, but brought average daily gain up from 2.43 to 2.49 pounds a day. Where hay and corn were fed in dry lot gain dropped to 2.39 and cost jumped to 16.8 cents. In the lots getting no corn in summer, gains were about 2 pounds a day at a cost of about 15 cents a pound.

In a similar experiment, different levels of corn feeding were compared. In 112 days this summer, steers on hay and full feed of corn (14.5 pounds a day) gained 2.59 pounds a day at a cost of 14 cents per pound of gain. Steers getting 13.9 pounds of corn on limited pasture gained 2.5 pounds a day at a cost of 12.1 cents per pound of gain. Steers getting only 7 pounds of corn on unlimited pasture showed figures of 2.22 pounds of gain and 9.1 cents cost. Heavier corn feeding gave more daily weight gain, but at higher cost.

Under way at Michigan State University are tests with tranquilizers on cattle. "Most research to date indicates these drugs improve growth rate 8 to 10 per cent and feed efficiency 4 to 6 per cent in experiments, especially when stilbestrol has also been fed," reported Dr. C. K. Whitehair, Michigan State

Reprinted by permission from Michigan Farmer, 322 Abbott Road, East Lansing, Michigan

University veterinarian. "Proposed uses are to reduce shipping shrinkage, calm nervous cattle and to decrease tension such as at weaning and dehorning."

In tests all over the U. S. in feeding antibiotics to beef cattle, no trace of the drugs has been found in the meat, said Whitehair. Cattle on high-grain ration generally gained less weight from antibiotics than others. When antibiotics were fed with stilbestrol there is an adding up of efficiency of gain.

Of much interest was a panel discussion on feeding soft corn. Dr. Lee Hileman, Shepherd, Michigan, has put up ground ear corn in a 12- by 45-foot tower silo with good results. He feeds 300 head of cattle. Water is added to bring the corn over 25 per cent moisture to preserve it better. The corn is taken out with a silo unloader. He planned to fill a 20- by 60-foot silo with wet corn this fall.

Norman Keller, Blissfield, Michigan, feeds his cattle high moisture shelled corn from a 20- by 50-foot glass-lined silo. "The corn keeps well and the cattle really like it," he said. This fall he plans to put a 2-row picker head on a chopper to grind ear corn in the field.

Ray Wilt, Blissfield cattle feeder, uses 3 20- by 50-foot glass-lined silos for high moisture corn, and that isn't enough, he finds. At first he ensiled shelled corn, but now puts up ground corn and cob, combined with corn silage. There is no spoilage.

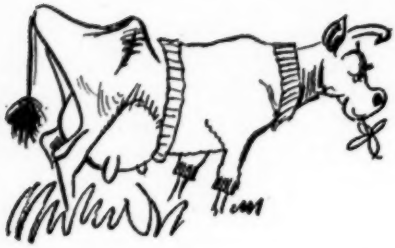
These results will help you do a better job of cattle feeding in the future.

Calf Born Nearly Four Years After Daddy Died

A Holstein heifer calf was born in Central Ohio recently—nearly four years after the death of her daddy. She was conceived with 37-months-old frozen sperm in the Ohio State University herd at Columbus, Ohio. Her daddy was the registered Holstein sire, Rag Apple Var Model 1011334, who died on November 24, 1954.

The sperm was collected at the Central Ohio Breeding Association in November of 1954 and the calf was born on September 8, 1958. Dean Shoemaker, COBA Technician who artificially inseminated the calf's dam, Ohio Conqueror Georgia 4058081, had carried the ampule of sperm for 14 months in the trunk of his car stored with dry ice. Prior to that it had been stored at COBA at a temperature of 118 degrees below zero Fahrenheit.

How Inherited Non-Lethal Traits Affect Your Cattle



Inheritance influences a great number of animal traits. This genetic presentation gives you some interesting facts . . .

Condensed from
Western Dairy Journal
L. O. Gilmore,
N. S. Fechheimer

ALL the traits cattle possess are affected by both their inheritance and by the environment to which they are subjected.

Animals inherit potentials for such things as sex, reproductive efficiency, ability to live, susceptibility to disease, color, temperament, growth rate, feed utilization efficiency, production and type. In regard to some traits, such as milk production, any one unit of inheritance (gene) has a relatively small effect because many such genes are involved and because the characteristic is affected by many things other than inheritance.

Other traits, such as hair color, appear to be influenced to a greater extent by the animal's inheritance.

Pairs. Half of an individual's genes come from the sire and half from the dam. For this reason, genes occur in pairs in individuals. It is the nature of some pairs of genes, if two are present that only one of these will show. The one showing itself is called dominant and the one not expressed is called recessive. A recessive gene must be present twice in an individual to be expressed.

In order for the recessive gene to be present twice, it must have been received from both the sire and dam. It is possible, therefore, for an animal to carry many recessive genes which we cannot know about because their expression is curbed by the presence of a dominant gene. When you see a calf showing a trait conditioned by a recessive gene, you know the calf has two recessive genes; therefore, each parent has one of these genes.

Undesirable. Traits conditioned by recessive genes are usually less desirable than those condi-

Reprinted by permission from Western Dairy Journal, 4511 Produce Plaza, Los Angeles 58

tioned by dominant genes. Therefore, it is important to keep the level of recessive genes in breeding stock low so the chance that two of them will appear in the same animal is low.

Slaughtering otherwise worthwhile animals known to carry undesirable recessive genes is not the most economical way to eliminate these genes. It is more worthwhile to be careful in choosing a sire so that you don't use two bulls in succession which carry the same undesirable gene. To do this, one must know genes and be able to distinguish these from similar conditions in which the primary cause may be other factors.

"What a man does not understand he does not possess."
—Goethe

Accordingly, the following list of the more important non-lethal physical traits, most of which are caused by recessive genes, has been prepared.

Dwarfism. Calves with proportionate dwarfism cannot be distinguished from normal until they are approximately one year old. Because they grow more slowly than normal calves, their appearance at this age is smaller in weight and heart girth and shorter in height. Affected cattle reproduce at a somewhat lower rate than normal. Their production is within the normal range, considering their size. Over-all or proportionate reduction in size distinguishes this type of dwarf from shorter or long-headed dwarfs. Proportionate dwarfism is caused by a recessive gene.

Two or more vertebrae in the tail are sometimes fused to give a twisted, bent or crooked appearance. This is known as screw tail and causes the tail to be shortened accordingly. It is apparent at birth, but fusion may not be completed until four to six weeks later. This is caused by a recessive gene.

Cataracts. Blindness in calves may be associated with such defects as small eyes and cataracts. Cataracts appear to be the most striking symptom. The defect may be present at birth, perhaps developing during the last two months of gestation. It also is caused by a recessive gene.

Strabismus or cross eye seems to be different from cataract blindness yet is also caused by a recessive gene. This eye defect cannot be detected at birth but shows up six months to one year later, with most cases identified after 12 months. Bulging or protrusion of the eyeballs is usually associated with observed cases and generally precedes strabismus. The condition gets progressively worse with age and vision is greatly impaired in some adult cows.

Ears. Notched ears are present at birth and affects both ears. The responsible gene is semi-dominant. When only one is present, the ear is slightly reduced in size. When the gene is present twice, the condition is more severe, reducing the ear to half its normal length.

Only one toe occurs on one to four feet affected with syndactalism. The toe is narrower than a foot with two toes, so there is less sole surface in contact with the ground. This causes instability on a smooth surface. Feet damaged by this recessive gene have a tendency to become sore.

Front feet only are affected by misshapen feet from between two to four months of age. The toes are spread wide apart and the hooves appear misshapen. Calves get lame, don't like to stand on their front feet and are often seen kneeling. This is conditioned by a recessive gene.

Pasterns. With flexed pasterns, the feet are turned back so the calf walks on its toes or, in severe cases, on the front of the feet. The front feet are always affected, and the rear feet are sometimes affected also. This defect is present at birth but disappears in a few days to two weeks. It is inherited as a recessive gene, but a similar condition is probably also caused by non-hereditary factors.

At birth, the only manifestation of spastic lameness is abnormally straight hind legs and a unique high tail carriage. At two to six months of age, one hind foot will occasionally miss the ground when the animal is moving at a walk. Subsequently, the affected leg appears shortened so that is doesn't contact the ground. Calves with this trouble have difficulty rising, and their balance is poor for a short time after they get up. This is probably caused by a recessive gene.

Seven Pillars of Unwisdom

1. We tried that once before.
2. It costs too much.
3. We've never done it that way.
4. That's not our responsibility.
5. We're not ready for that.
6. We're doing all right without it.
7. It won't work.

Teats. In the case of fused teats, the teats on the same side of the udder are fused for 1/3-3/4 of their length by skin common to both. Two teat orifices and two teat cisterns are present. This ordinarily occurs only on one side of the udder and appears to be caused by a recessive gene which causes close spacing of the teats.

At birth the coat of hair is thin, short, fine and curly when the condition known as semi-hairlessness occurs. Hair on the legs and back is longer and thicker than elsewhere. It is patchy and later becomes wiry. The skin is wrinkled and scaly. Affected animals are wilder than others and don't reach expected size. Teeth may be absent at birth. These traits don't cause death at birth as happens in still another hairless trait. This condition is caused by a recessive gene.

If all the broilers raised in the nation in 1958 could be gathered into a single flock, Agricultural Marketing Service estimates it would contain 1,600,000,000 birds.

Curly Coat. Curly hair at birth gives a wooly or Karakul-like appearance in adults. It is a dominant trait, although the recessive form is also found in cattle.

With albinism, the hair and skin are extremely low in pigment and the hair is white, while the eyes are pink because blood vessels show through the outer membranes. Albinos from black and white spotted breeds seem to have a ghost pattern because of the difference in hair structure in areas normally black as compared to white areas.

Recessive inheritance prevents formation of any pigment regardless of other color genes that may be present.

Hair and skin in colored areas is sometimes red instead of black even though both parents are black and white. Red hair has 4-5% pigment, whereas there is 6-9% in black hair. This is caused by a recessive gene.

Different. White heads in dairy cattle are different from the Hereford pattern, which includes a white head with a more or less solid body. The white head in spotted breeds may not have any pigment around the eye. This is caused by a dominant gene.

There are many other traits in cattle for which genes undoubtedly are an important causative agent. Although the evidence that they are inherited is good, it does not allow an interpretation of the mode of inheritance. Specific examples include parrot jaw, wry face, roached back, wry tail, taillessness, hernia and cryptorchidism.

Winter slumps in egg production can be prevented by getting the layers to eat plenty of feed. Housing, health, weather, or a combination of these may affect feed consumption, but feed management always is important.

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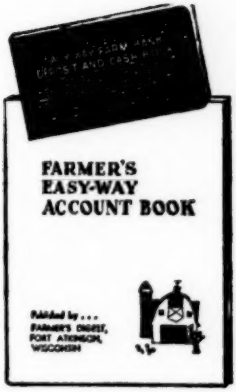

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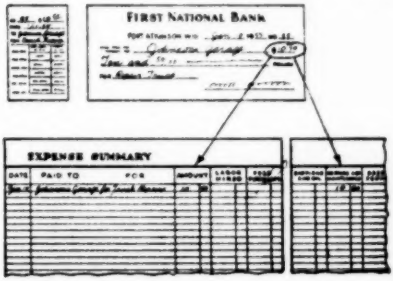

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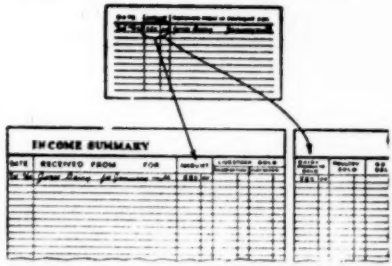

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